Measuring TUWRAP's Influence: Final Report Appendices

1. TUWRAP Evaluation Methodology

2. Overview of Interviews

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4. DEQ TUWRAP Site Visit "To Do" List

5. Example Eastern Region Technical Assistance Site Visit Follow-up Letter

6. Approach to Revisit Sample Size Estimate

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Appendix 1:
TUWRAP Evaluation Methodology

May 2004 Note: During the data collection period, the project leads decided to streamline the data collection in the following ways: Informal conversations with EPA Region 10 staff were substituted for the second round of EPA interviews, the performance measure ranking exercise was not done during the interviews, and data collected during "step 2" did not include TRI releases or RCRA hazardous waste generation data. In addition, the data collection schedule was modified to allow more time for the DEQ Regions to gather the "step 2" data**.**

TU/WRAP Effectiveness Evaluation

Draft Project Evaluation and Reporting Methodology

January 27, 2004

Submitted by Ross & Associates Environmental Consulting, Ltd.

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Forward

The draft evaluation and reporting methodology includes five sections that, together, describe the Ross & Associates' (consultant team's) approach to the TU/WRAP effectiveness evaluation project. Table 1, below, describes each of the methodology's sections and their respective purposes.

Table 1. Project Evaluation and Reporting Methodology: Purpose of Each Section

Methodology Section	Purpose
Information Collection Plan	To provide a conceptual overview and to describe the four information collection components: data already provided to the consultant team, basic data collection, targeted data collection, and interviews with DEQ and EPA staff.
Information Analysis Plan	To provide a description of how the consultant team will analyze the collected information to answer the five principal evaluation questions (see Highlight 1). One analytical approach will be used to answer questions 2-4, and another will be used to answer questions 1 and 5.
Proposed Project Schedule	To provide a timeline for information collection, data analysis, report writing, the report oral briefing (with report conclusions and recommendations), and the final report completion.
Final Report Outline (Draft)	To provide an early draft outline of the final report's contents.
Oral Briefing and Presentation of Final Information	To provide an early agenda and overview for the oral briefing on the project's conclusions and recommendations.

I. Information Collection Plan

This information collection plan is intended to provide information that will answer the five principle evaluation questions shown in Highlight 1.

Highlight 1. Primary TU/WRAP Effectiveness Evaluation Questions

1. How should TU/WRAP effectiveness be measured?
    a. With currently collected, available data (including underutilized data)?
    b. If new performance measures were to be introduced that required different data?
2. What impact does TU/WRAP have on hazardous waste handler compliance in Oregon?
3. What are TU/WRAP's environmental outcomes?
4. What are the costs (range, per "unit") associated with TU/WRAP and compliance inspections?
5. How can Oregon DEQ and Region 10 strategically integrate TU/WRAP with the authorized hazardous waste enforcement program to achieve EPA's Goal 5 compliance improvement objectives?

Information Collection Plan: Context and Conceptual Approach

Although DEQ is making progress in the amount, type, and consistency of the data collected— and implementation of the OHWIME database is likely to help significantly in this area—the ideal data for the TU/WRAP effectiveness evaluation are not readily available for the following reasons:

- Facility level data are needed to effectively answer the five primary evaluation questions, as explained below.
- With few exceptions, DEQ does not track facility-level data other than in hard copy forms, and some facility-level information is captured solely in informal notes.
- With the possible exception of the Western Region's specific forms (waiting to verify), the forms that are used do not include environmental outcome fields. Outcome information, when provided, is derived informally through conversations between the field staff and the businesses that have received technical assistance.
- The information tracked by field staff does not include the resource expenditures (i.e., time spent) on each visit or follow-up visits/calls.
- The relationship between a facility's technical assistance activity and compliance assurance activities and their respective or cumulative effects is not consistently tracked.

The enclosed information collection plan provides a suggested route for addressing these data challenges, but in the end, the quality and consistency of the original field data (which have yet to be characterized), coupled with the breadth and depth of information that can be covered during the interviews, will determine the extent to which the five questions (particularly questions 2-4) can be answered.

The information collection plan represents an effort to define a "conceptually pure" analysis that will isolate, to the greatest extent possible, the effect of technical assistance site visits on compliance outcomes. At this time, it is not entirely clear that sufficient data will either exist and/or be available (cost effectively) to support this approach. The contracting team fully expects DEQ technical assistance staff

and the project's EPA participants to contribute to refining the analytical approach, ensuring that the approach is consistent with available data and staff resources.

The consultant team, in coordination with DEQ and EPA staff, has also made the following judgment calls that have influenced the plan's design:

- Because a substantial amount of TU/WRAP technical assistance is conducted through site visits and the data available on site visit history are more detailed and more consistent than the data available on the other technical assistance activities, this information collection plan focuses on the technical assistance visits (including visits called compliance assistance visits, technical assistance visits, and TUR visits) as the primary "unit" for assessing TU/WRAP's results. However, any and all additional information that DEQ provides on other technical assistance activities, such as trainings, will also be factored into the evaluation and final recommendations.
- Because the TU/WRAP effectiveness evaluation project stems from discussions about whether TU/WRAP achieves the same or similar goals as the traditional compliance assurance program, this plan focuses on methods for isolating out those factors that will explore the relationship between technical assistance visits and compliance. Doing so requires that a variety of comparisons be made and that compliance "influencers" be isolated, as explained in more detail below.
- The consultant team is aware that many factors—such as public pressure, "bad press" focused on high-profile facilities that have been fined for non-compliance, the internal management commitment and capacity to achieve compliance, etc.—are likely to influence a facility's compliance rate and environmental management practices. Ideally, a project trying to isolate-out and gauge TU/WRAP effectiveness on compliance would gather statistically-valid data on each of these potentially influential factors and then do a systematic analysis that would scientifically demonstrate the results of TU/WRAP alone. A project such as this would require substantially more data than are currently available (virtually anywhere in the world) and a project of much larger scope than the current one. Therefore, in this plan, the consultant team has knowingly focused on only two probable influential factors that are in line with the original description and scope of the project: whether facilities received technical assistance and whether they received technical assistance and a compliance inspection. That said, the evaluation will acknowledge that other factors also influence facilities' decisions and management practices.

Taking into consideration the aforementioned caveats and data uncertainties, the information collection plan is designed to gather targeted information about the changes in compliance and environmental management practices that result from technical assistance visits by DEQ staff. The plan entails addressing the primary questions through a combination of targeted data collection and interviews that, using currently-available data, will provide sufficient depth and breadth to answer these five questions. Table 2 shows how the questions apply to each information collection approach.

Table 2. Information Collection Approaches to Answering the five Primary Questions

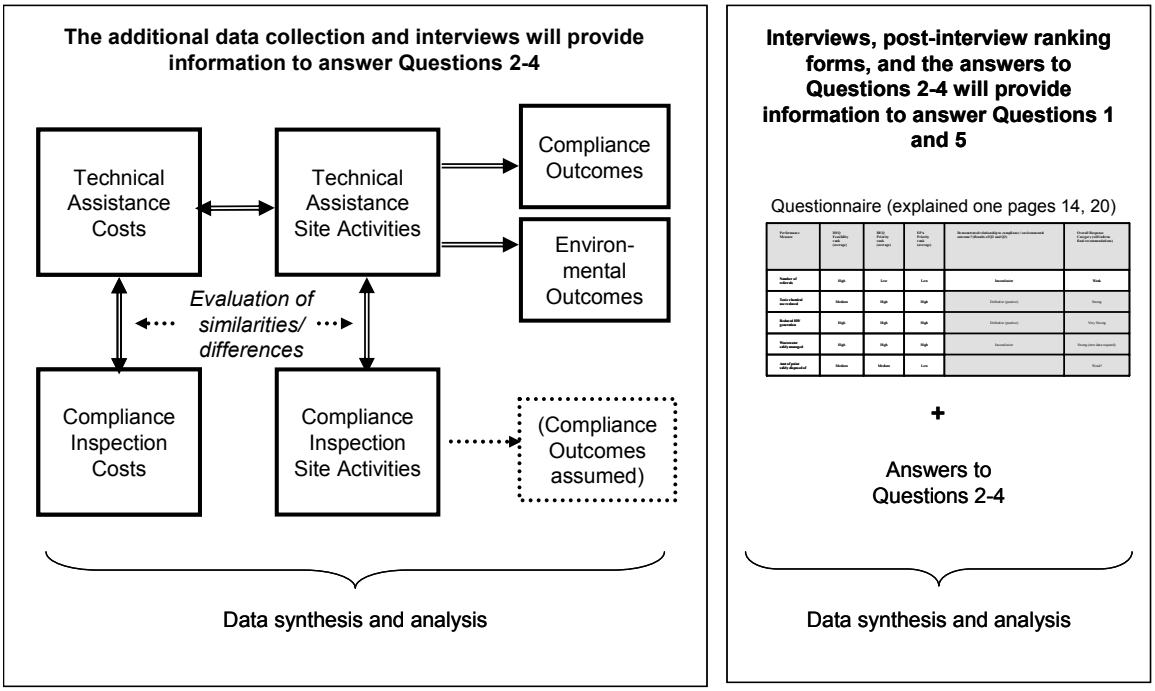
Question	Review of provided data	Additional Data Collection	Interviews with DEQ and EPA Staff
1: How should TA effectiveness be measured?	X		X
2: Effect of TA visits on compliance?	X	**X**	X
3. TU/WRAP's environmental outcomes?	X	**X**	
4: Costs associated with TU/WRAP and compliance inspections?	X		**X**

5: Achieving Strategic Plan Goal 5?	X		X

X (bold) = most of the needed information will come from this approach

Additional data collection and interviews will answer Questions 2-4 by (a) evaluating the effects of technical assistance visits on compliance and environmental outcomes (Questions 2 and 3) and the costs of technical assistance and compliance inspections (Question 4); and (b) evaluating the similarities and differences between compliance inspection costs and activities and technical assistance costs and activities. Interviews, post-interview performance measure ranking questionnaires, and the results of questions 2 - 4 will be used to answer questions 1 and 5. Figure 1, below, illustrates the interrelationship between the information collection approach and analysis approach to answering all five questions. (The information analysis plan that is illustrated in brief in Figure 1 is described in more detail in the following pages.)

Figure 1. Relationship Between the five Primary Questions and the Information Collection and Analysis Plans



Overview of Provided Data

Much of the information collection plan relies on the collection of targeted additional data, however, the information that has already been provided by DEQ and EPA staff to the consultant team is informative and will also be used to help answer the five principal questions. Below is a list of the already provided information sources:

Joint DEQ-EPA documents

- Performance Partnership Agreement between the Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency Region 10 (July 1, 2002 - June 30, 2004)

DEQ documents and data

- DEQ Toxic Use and Hazardous Waste Reduction Law Implementation: 2002 Status Report
- DEQ PPA FY 2002 Year End Report
- DEQ Western Region Hazardous Waste Performance FY 2003
- DEQ Toxics Use and Waste Reduction Assistance Program: 2001 Status Report
- DEQ Hazardous Waste Funding Data
- Performance Partnership Agreement 2001-2002: DEQ Hazardous Waste Program EPA Progress Report for July 2001-June 2002
- DEQ Waste Reduction Assistance Program (WRAP) Site Visit "To Do List"
- DEQ Waste Reduction Assistance Program (WRAP) Checklist Guide
- DEQ Fact Sheet on Oregon's Toxics Use Reduction and Hazardous Waste Reduction Act
- DEQ Fact Sheet on Oregon's Toxics Use Reduction Law
- DEQ Pollution Prevention Success Stories
- DEQ Hazardous Waste Technical Assistance: Outreach to the Tualatin River Basin
- DEQ A-3 Channel Stormwater/Waste Management Assistance Measurement Project
- DEQ Western Region Hazardous Waste Performance Measures for July 2000-June 2001
- DEQ Western Region Hazardous Waste Performance End of Year Report January 2001 – June 2002
- DEQ OHWIME "Screen 22 – Measures"

EPA Documents

- EPA Region 10 Fiscal Year 2002 Accomplishment Narrative for Enforcement and Compliance
- EPA Strategic Plan 2003-2008: Direction for the Future, September 30, 2003
- EPA OECA Guide for Measuring Compliance Assistance Outcomes revised June 2002
- EPA OECA Enforcement and Compliance Assurance Accomplishments Report, FY 2002
- EPA OECA Compliance Indicators Project Report, Appendices and Summary Report, April 2002
- EPA OECA Memorandum of Agreement Guidance, FY 2002-2003
- EPA Program Assessment Ratings Tool (PART) Questions FY 2004 Budget Formulation Process
- EPA Evaluation of EPA New England's Colleges and Universities Initiative
- EPA OECA Report on the Analysis of Washington Department of Ecology's "Change in Generator Compliance Using Regulatory Compliance Indicators" April 2002
- EPA OECA Annual Accomplishments Report 2000

The plan's two proposed information collection methods, additional targeted data collection and staff interviews, are outlined in the following sections.

Additional Targeted Data Collection

To answer questions 2 and 3, and to help provide insights into the answers for all five questions, this plan calls for DEQ to collect additional targeted data on four groups of facilities that received technical assistance. DEQ should already have these data, however, in most instances the data are likely to be kept in the individual forms filled out by field staff for each facility. The additional data collection will require field staff to summarize and cross-reference existing data in the requested format.

The additional targeted data collection is focusing on information on technical assistance site visits because the site visits comprise the bulk of the technical assistance activities, data are available on site visits, and the type of data collected on site visits appears to be more consistent across the regions than the data collected on other technical assistance activities. However, the additional data collection will also involve a request for DEQ staff to provide any and all available data about other technical assistance

activities, such as trainings. The consultant team will incorporate this "other activity" information, including surveys collected by the technical assistance recipients, into the project evaluation including the answers to the five principle questions.

The requested data will focus on four targeted populations.

Group A: Facilities that had no prior inspections or technical assistance (for at least five years[1]), received a technical assistance visit in FY 2001 or FY 2002, and then had a compliance inspection and/or technical assistance follow up in either FY 2002 or FY 2003.[2]

Group B: Facilities that did not have technical assistance (for at least five years), had one compliance inspection, then received a technical assistance visit, and then had a compliance inspection and/or technical assistance follow up.

Group B2: Same group as B except that there were at least two compliance inspections prior to the technical assistance visit.

Group C: The field staff's "best" technical assistance examples.

These groups are explained in more detail below, starting with an explanation of why it is necessary to isolate, to the extent possible, the influence of technical assistance from the influence of compliance inspections.

Although there could be several reasons why companies come into or fall out of compliance and/or change their environmental management practices, this plan is focused on the influence of technical assistance as opposed to compliance inspections on these behaviors. To this end, the evaluation focuses on researching and assessing the behavioral changes of those facilities that have received technical assistance alone—without the added influence of compliance inspections. If this population were not isolated for the evaluation, there would be no way to distinguish the influence of prior compliance inspections from the influence of technical assistance activities.

Given that compliance can not be formally evaluated during technical assistance visits, the way to assess the compliance outcomes of technical assistance recipients is to examine the results of compliance inspections conducted *after* technical assistance visits. Similarly, the way to assess the effect of technical assistance visits on environmental management practices is to examine the technical assistance visit follow-up (calls, mail correspondence, and/or revisit) information. Therefore, to measure the effectiveness of the technical assistance visits, this plan entails focusing in on those facilities that had inspections and/or technical assistance follow up after their technical assistance visit.

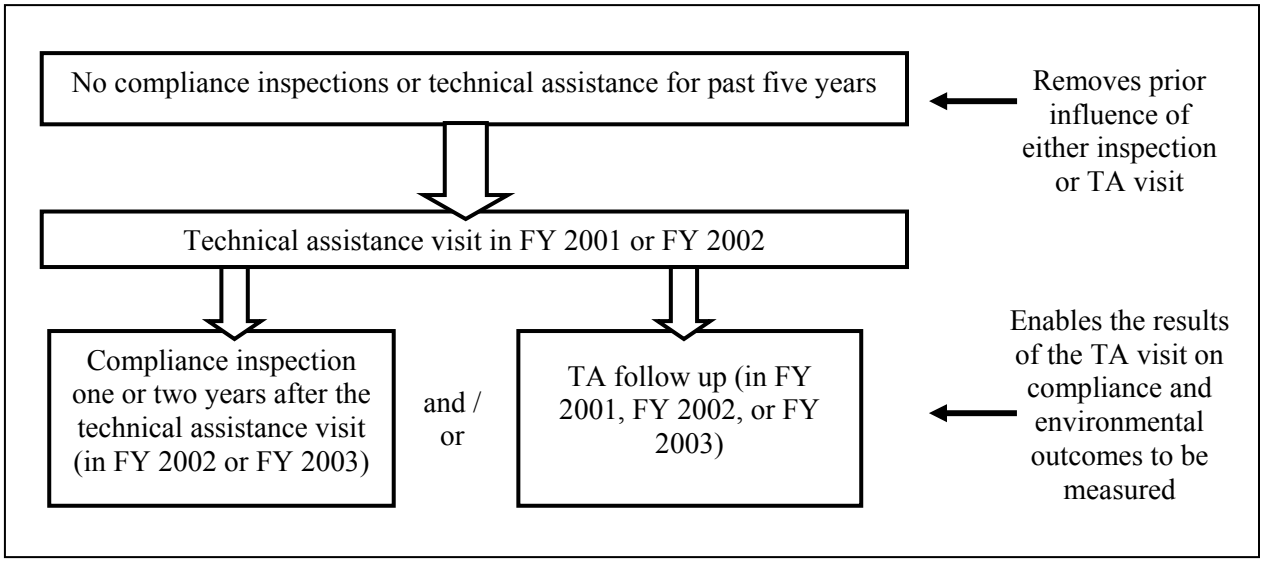
Target Group A

The first and primary target group for additional information collection are those facilities that had no prior compliance inspection or technical assistance history, then had a technical assistance visit, then that had a compliance inspection and/or some kind of TA follow-up. Figure 2 depicts how group A should be isolated. An assessment of group A's final compliance history and environmental outcomes will most definitively answer questions 2 and 3 because, prior to the technical assistance visit, these facilities did not have interaction and thereby influence via either an inspection or a previous TA visit.

[1] To minimize the chance that previous inspections would have already influenced the facility's interest in or responsiveness to technical assistance.

[2] The idea behind limiting the data to a particular set of years is to not undertake a huge data collection effort. If data for technical assistance during the proposed years is not available, data on earlier technical assistance activities may suffice. In this case, the DEQ staff should contact the consultant team to decide how to move forward.

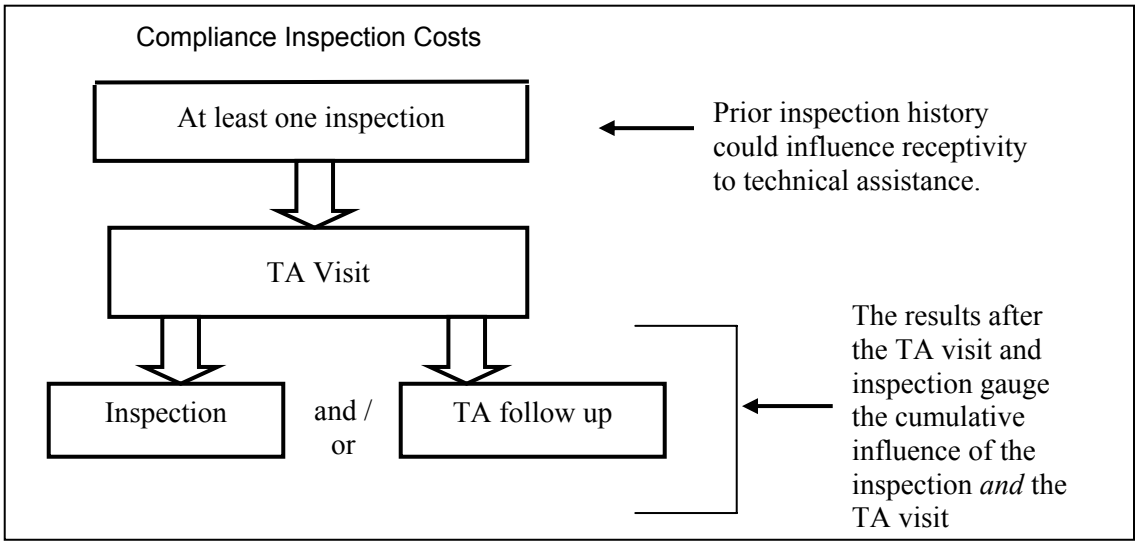
Figure 2. Primary Target Evaluation Population: Group A



Target Group B

There is likely to be a population of facilities that first received a compliance inspection, then, a year or so later, received a technical assistance visit, and then either had technical assistance follow-up and/or another compliance inspection (which would have verified whether the facility was in compliance following the technical assistance visit). This population may have been influenced by both the compliance inspection *and* the technical assistance visit. An examination of this "mixed" population, group B, may be able to provide insights into the question "does engaging the same facility in both activities have a different result than engaging solely in technical assistance?" Figure 3 illustrates how this group should be isolated from other technical assistance recipients. The evaluation will consider whether the inspection and technical assistance populations are significantly different and therefore can not be directly compared.

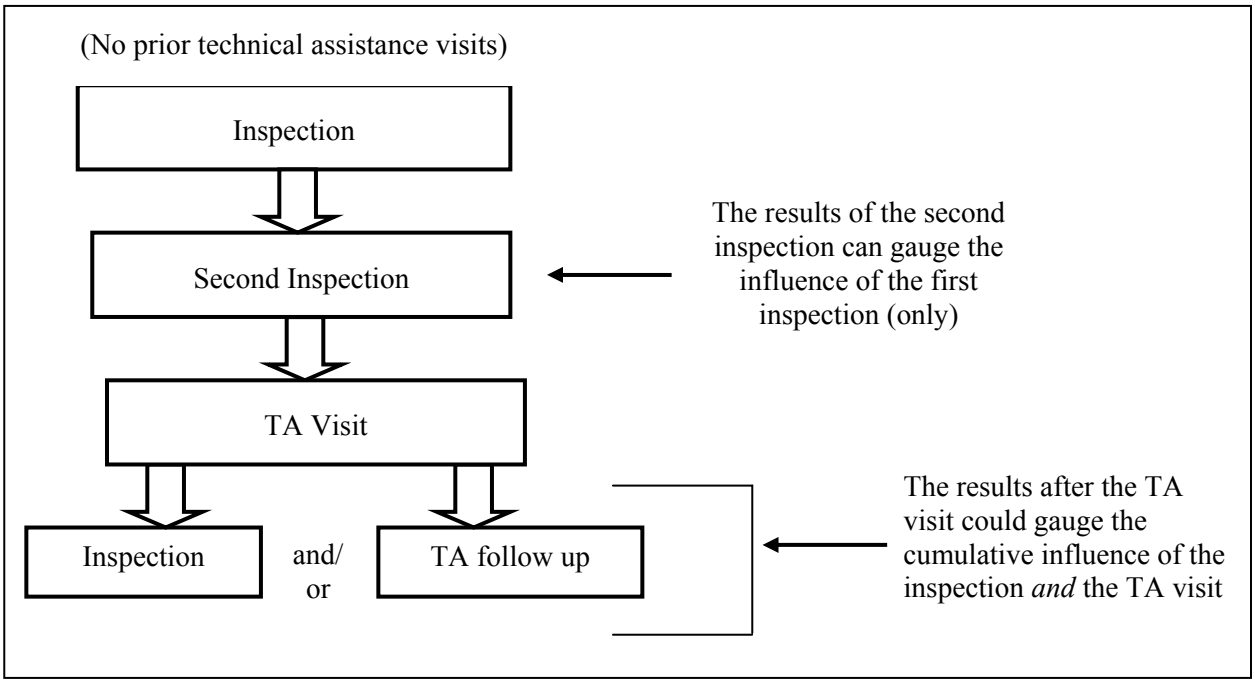
Figure 3. Target Population Group B



Target Group B2

This plan proposes to go one step further—examine a subset of group B to isolate whether the influence of the inspection/TA "mix" was due more to the inspection, the technical assistance visit, or both. In order to draw out these individual influences an additional targeted sampling is made of those facilities that had at least two compliance inspections prior to receiving a technical assistance visit (and then had another compliance inspection and/or TA follow up). Looking at the compliance rate of this group after the second inspection would gauge the effectiveness of the first inspection alone prior to receiving a technical assistance visit. Then, looking again at the same facilities' behavior after they later received technical assistance would allow for a comparison of the isolated effects of the inspection only versus the cumulate effects of the inspection plus TA visit. Figure 4 illustrates the logic behind targeting group B2.

Figure 4. Population Group B2



Target Group C

Finally, the plan will involve asking the Regions to collect information (the same information that they will collect for groups A, B, and B2) for one last group, group C. Group C will simply be those facilities that, in the opinion of the TA field staff, have been the most responsive to technical assistance visits. This group may also be thought of as the "best results" group and can include any facilities regardless of whether they have past compliance inspection or technical assistance history. (The information that will be gathered on this group will include past compliance inspection technical assistance history, so this information will be available.)

This group is being included because (1) the field staff are likely to be most familiar with this group, (2) more and better quality data may be available, (3) demonstrating the "best case" results will illustrate the full potential of the technical assistance program, and (4) a comparison of this group's results with the results of groups A, B, and B2 with inform the project's overall findings. Field staff may add as many

entries for this group as they wish, and it is okay for this group to overlap with groups A, B, and B2 (as long as it is possible to identify the overlap).

In addition to the information on the site visit target populations, DEQ staff will be asked to provide information that they have available on the other types of technical assistance activities that they conduct.

Process

This plan proposes to narrow down a sample population for focused inquiry that will explore technical assistance effectiveness for each and all of the four target groups. First, however, basic data on all of the potential facilities needs to be collected in order to narrow down the sample population. The following process outlines how this will work:

Step 1. Collection of basic data: Field staff collect basic data on all of the facilities that fit the criteria for groups A, B, B2, and C and any and all information that is available on the other technical assistance activities that DEQ conducts. The consultant team will choose a subset of facilities from the A, B, and B2 groups for more detailed data collection. The subset list will be sent to the DEQ field staff.

Step 2. DEQ field staff provide detailed data on the subset chosen for more focused inquiry.

Step 1: Collection of Basic Data

To provide a baseline set of information from which to choose the focus subset, DEQ field staff are asked to compile the information shown in Table 3 for all facilities that received technical assistance in FY 2001 and FY 2002[3] and would apply to any of the four target groups. Step 1 focuses on two years of technical assistance recipients to (hopefully) provide a sufficiently large population to represent all groups, but that is not spanning so many years that the "pool" of candidates and work required to compile these basic data would be overwhelmingly large. To keep the influence of any particular technical assistance visit as "clean" as possible, an effort will be made to include facilities that have received only one technical assistance site visit within the targeted time period because receiving more than one visit (like receiving an inspection and a site visit) could have a cumulative influence on the facility.

Table 3: Requested Baseline Data for all Four Target Groups

Facility Name	SIC Code	LQG (Y/N)	SQG (Y/N)	TRI reporter ? (Y/N)	TA visit/ activity date (Mo /Yr)	Why TA was conducted	TA follow up?	Type of TA follow-up	TA follow up date (Mo /Yr)	Compli-ance inspect-tions since FY 1996 (Mo/Yr)	Target Group
Acme A	11111	Y	N	Y	06/01	Visit requested	N	n/a	n/a	03/99, 06/00, 06/02	B2
Acme B	22222	N	Y	N	03/02	In Portland Harbor	Y	Phone call	07/02	03/03	A
Acme C	33333	Y	N	Y	10/01	Target Industry	Y	Site revisit	03/02	n/a	C

Specific notes:

- It is not necessary to include information on facilities that received technical assistance, but no follow-up or subsequent compliance inspection (because the results of the technical assistance will not be traceable).

[3] See footnote on page 6.

The consultant team is aware that this exercise will require field staff to gather information in one place on both technical assistance history and compliance inspection history. While this may require extra work for the staff gathering these data, the lack of these basic data will require rethinking the nature of the effectiveness evaluation.

Step 2: Focus Sample Group

Based on the information received from Step 1, the consultant team will choose a subset of facilities to assess more closely and in so doing answer questions 2-4. The subset will be chosen to represent a spectrum of TA recipients from each of the target populations. Although the number of focus facilities will be determined after Step 1, the total number of focus facilities (with the exception of group C, the number of which can be determined by DEQ staff) is not expected to exceed more than 75 (DEQ-wide).

Detailed profiles for the focus sample group will include the following information:

General Facility Information

- Name of facility
- Location (City)
- SIC code
- SQG/LQG?
- TRI reporter?
- (Other facility grouping or identifier?)

TA information

- Date of TA visit(s) or other TA activity in FY 2001 and FY 2002
- Dates of previous TA visits or other TA activity (FY 1996-FY 2000)
- Reason for conducting TA visit or other TA activity
- Comments on visit
- Number of recommendations
- Content/type of recommendations
- Type of technical assistance follow-up (phone, visit, survey, none, etc.)
- Number of recommendations implemented
- How is it known that the recommendations were implemented?
- Other actions taken, if applicable
- TA staff name
- Comments (optional)

TA: Environmental Outcomes (if known)

Included will be a request for as much detailed information as possible about the following measures and also any other measures that were used/tracked for each facility. The idea is to gather the same information that is already collected for each facility and not to artificially "fit" that information into the categories outlined below, which are only included as examples of the types of information that might be collected. DEQ staff will also be asked to provide their working definitions for the outcomes (e.g., what does "reduced" mean?).

- Hazardous waste reduced
- Hazardous waste diverted
- Hazardous waste safely managed
- Toxic chemicals reduced
- Toxic chemicals diverted

- Toxic chemicals safely managed
- Wastewater reduced
- Wastewater diverted
- Wastewater safely managed
- Other environmental management change, if any
- How is it known that the environmental outcome was achieved?
- Comments (optional)

Compliance History

- Compliance inspection dates since January 1996
- Results of compliance inspections
- Reason for conducting the inspection
- Results of inspection (if there is something to add here besides NON or in compliance)
- Recommended inspection follow up (including TA visits)
- Follow up actions
- Comments (optional)

Hazardous Waste Generation / Toxic Release History

If applicable and available: data through 2002 will suffice in those instances where 2003 data are not available.

- TRI releases to air, water, and land, 1998-2003
- Amount of hazardous waste generated, 1998-2003

Data Quality

- What, if any, measures have been taken to ensure the accuracy of the information provided in this questionnaire?

Interviews with DEQ and EPA Staff

Interviews with DEQ Staff

Interviews will be conducted with DEQ staff to serve the following purposes:

1. To more holistically understand how the technical assistance program works;
2. To more holistically understand the relationship between technical assistance activities and compliance inspections;
3. To understand the role of other technical assistance activities besides technical assistance visits and gain a better understanding of the kind of information currently collected when these other activities are conducted;
4. To characterize the activities conducted during compliance inspections (this is added to gauge the extent to which the TA and inspection activities are similar);
5. To develop a lifecycle cost outline for technical assistance and compliance inspection activities
    a. Learn enough about the costs of conducting technical assistance visits (and, to some extent, other technical assistance activities) so that a range and average costs for technical assistance per facility can be assessed;

   b. Learn enough about the costs of conducting compliance inspections so that the cost comparison between technical assistance activities and compliance inspections can be made;

6. To discuss ideas about how technical assistance effectiveness could be measured
   a. With currently collected, available data and current performance measures?
   b. If new performance measures were to be introduced that required different data?

7. To explore ideas for how Oregon and Region 10 strategically integrate the TU/WRAP with the authorized hazardous waste enforcement program to achieve EPA's Goal 5 compliance improvement objectives.

Process for DEQ Interviews

The consultant team would hold 8-12 interviews: 3-6 with the staff from the three DEQ Regions, and 3-4 with DEQ Headquarters staff. The number of interviews will depend upon whether the TU/WRAP and compliance staff are the same or different in each case. The in-person interviews would take place in the Portland office and all other interviews would be via teleconference. Preferably, the DEQ regional interviewees would travel to Portland for their interviews.

For each of the three DEQ Regions, the consultant team will conduct one or two interviews, depending on whether the TU/WRAP and compliance staff to be interviewed are the same or different individuals. The goal would be to interview both the TU/WRAP and compliance staff and that the interviews would involve both field staff and senior regional management. Each interview would involve two Ross & Associates consultants and preferably at least two, but no more than six, DEQ interviewees. Below is an example list of interviews that illustrates this approach:

NW Region (assumes separate compliance and TA field staff and management):
1 interview with compliance field staff and management
1 interview with TA field staff and management

Eastern Region (assumes combined compliance and TA field staff and management)
1 interview with compliance/TA field staff and management

Western Region (assumes combined compliance and TA field staff and management)
1 interview with compliance/TA field staff and management

DEQ Headquarters (assumes separate compliance and TU/WRAP staff):
1 interview with TU/WRAP management
1 interview with compliance management
1 interview with the OHWIME developer (questions for this interview will focus on OHWIME plans and ideas for performance measure data collection and synthesis)

EPA Region 10
1 interview with TU/WRAP contact/officer
1 interview with compliance contact/officer

(Total number of interviews = 9)

Sample DEQ Interview Agenda

This plan proposes holding three-hour interviews with the following agenda.

Topic	Suggested Duration (Minutes)
Introductions	15
Project background and interview context	15
Confirmation of background information	15
Questions and discussion	120
Technical assistance practices	(40)
Compliance inspection practices	(30)
(Break)	(10)
Options for future effectiveness measurement	(40)
Description of Performance Measure Ranking Form	10
Wrap up and next steps	5

Sample DEQ Interview Questions

The following sample interview questions reflect the directions of the interviews. They will be further refined and detailed based in part on the feedback received from DEQ and EPA.

After introductions, 15 minutes will be spent confirming the information that the consultant team already has from the Region and outlining the background information (to be provided by the consultant team or DEQ to the interviewees ahead of time) on the project's goals related to performance and outcome reporting.

The following sample questions demonstrate the types of questions that will be asked at the DEQ interviews:

Current Technical Assistance Practices (40 minutes)

- What are your roles and responsibilities for TU/WRAP?
- How many TA visits do you conduct in a given year?
- How are the TA facilities chosen?
- Please describe a typical (not outstanding) TA visit from beginning to end.
- Please describe the most effective TA visit you participated in or are familiar with.
- What other kinds of technical assistance activities do you conduct (besides TA visits).
- What kind of information is collected for the other activities?
- What kind of follow up activities, if any, are conducted for these other activities?
- What facilities do you think are likely to be the most and the least responsive to technical assistance and why?
- What facilities do you think are most likely to respond to compliance inspections and why?
- Please describe the Region's/Headquarters' TA activities in the following way so that we can profile specific activities and develop an event lifecycle cost estimate for TU/WRAP.

Work involved in conducting technical assistance site visits (from start to finish)

Individual (Role/Title)	Task	Number of hours (can be a range)	Hours billed to (x) program

Compliance Inspections (30 minutes)

- Please summarize for us the process for compliance inspections.
- Please describe the situation where compliance inspections cover the same kind of questions and topics that would be covered by a technical assistance visit.
- Please describe when, if ever, compliance inspections result in recommendations for technical assistance visits.
- Please describe the Region's/Headquarters' compliance inspection activities in the following way so that we can profile specific activities, determine the extent to which these activities are the same as technical assistance activities, and develop an event lifecycle cost estimate for compliance inspections.

Work involved in conducting compliance inspections (from start to finish)

Individual (Role/Title)	Task	Number of hours (can be a range)	Hours billed to (x) program

Future Reporting Options (40 minutes)

- Do you think TU/WRAP effectiveness, particularly environmental outcomes, could be measured in a better way using existing data? Why?
- What kind of additional data do you think could be collected to measure TU/WRAP's effectiveness?
- What kind of specific cost information do you think could be tracked to gauge TU/WRAP's cost effectiveness?
- [After reviewing with interviewees the highlights of the EPA Strategic Plan's Goal 5] What are your ideas for how DEQ and Region 10 can strategically integrated TU/WRAP with DEQ's hazardous waste enforcement program to achieve EPA's Goal 5?

In addition to going over the questions during the interview, the consultant team plans to ask interviewees to complete and submit after the interview a performance measure ranking form which is conceptually outlined below in Table 4. The purpose of this exercise is to receive consistent, measurable feedback from DEQ staff about the performance measures that could be recommended in the project's final report (questions 1 and 5).

Table 4. Conceptual Example of Performance Measure Ranking Form

Performance Measurement	Source	Feasibility (High, Medium, or Low)	Priority (High, Medium, or Low)
Number of referrals	TU/WRAP publications		
Toxic chemical use reduced	PPA		
Reduced HW generation	EPA Strategic Plan		
Wastewater diverted	TU/WRAP publications		
Paint safely disposed of	TU/WRAP publications		

Interviews with EPA Staff

In addition to the interviews with DEQ staff, the consultant team will hold two sets of interviews with the EPA Region 10 staff. These interviews will be different than the interviews with DEQ staff. Although some of the discussion topics will be the same (especially on items 6 and 7, listed above) the majority of these discussions will be geared toward discussions about the kind of information about TU/WRAP that EPA is interested in.

The first set of interviews will take place before the DEQ interviews and will be focused on identifying EPA's interests and needs ("bottom lines") for both compliance reporting and accountability purposes. The intent of these interviews is to identify the type of information that EPA would want in order to "give credit" to technical assistance and recognize that technical assistance effects hazardous waste handler compliance. As a "critical customer" of information on the TU/WRAP program, EPA's thoughts on what the desired information on TU/WRAP would be will be one theme during the subsequent interviews with DEQ staff.

The second set of interviews with the EPA Region 10 staff will be focused on gauging an early "read" on EPA's reaction to the DEQ staffs' ideas on how TU/WRAP's effectiveness can and should be measured. The goal of these interviews is to see if there are major gaps or "sticking points" between EPA's and DEQ's perspective on how effectiveness can and should be measured in order for EPA to give credit to TU/WRAP.

The interview questions will focus largely on questions such as the following.

- What reporting requirements do you have (to Region 10 or EPA Headquarters) that require data on DEQ's TU/WRAP effectiveness?
- How do you think TU/WRAP effectiveness (as it relates to both compliance and environmental outcomes) would ideally be measured?
- How does effectiveness need to be measured for EPA to provide additional flexibility for how DEQ implements its delegated hazardous waste program?
- To what extent is there flexibility in making changes to or adding new information to the information on TU/WRAP effectiveness reported to EPA? [4]

EPA interviewees will also be asked to fill out the performance measure ranking form (Table 4) – minus the question on feasibility of data gathering, which can more definitively be answered by the DEQ staff – after the interview.

II. Information Analysis Plan

The information analysis plan is split into one an approach to answering questions 2-4 (see page 1) and another approach to answering questions 1 and 5.

[4] One of the major drivers behind developing Regional Plans is to allow EPA regions to engage in joint planning and priority setting with states. The Regional Plans are intended to capture those priorities and corresponding performance measures that may be unique to the Region or a particular state in the Region. EPA national programs are asked to consider the unique priorities and performance measures outlined in the Regional Plan and respond as possible and appropriate with flexibility in terms of what reporting requirements it asks of the Regions, and indirectly, the states.

Answering Questions 2-4

The additional targeted data collection and interviews will provide information with which to analyze (a) the compliance and environmental outcomes that result from technical assistance site visits and (b) the similarities and differences between the profiles of technical assistance site visits and profiles of compliance inspections. The combination of outcome, activity, and cost data together will serve as an information "triangulation strategy" that will draw upon a variety of data inputs that collectively will support solid conclusions about the relationship between technical assistance and, in particular, compliance outcomes.

Assessing technical assistance site visit impacts on hazardous waste handler compliance

The information already provided by DEQ; the additional information that will be provided about the targeted groups A, B, B2, and C; and the interviews will together provide the primary data from which to answer Question 2, "What impact does TU/WRAP have on hazardous waste handler compliance in Oregon?" The consultant team will analyze the data to determine the extent to which compliance and environmental outcomes can be associated with technical assistance visits. Target group A will be the strongest population from which to try to answer this question because it will be comprised of facilities that did not receive compliance inspections or prior technical assistance, and therefore is the most "pure" sample population. It is unclear at this time how large the population of facilities that meet the group A criteria will be whether the data available on this group will influence the strength of the conclusions that can be drawn from this group alone. Therefore, the data provided on groups B, B2, and C may help to supplement the data provided on group A to answer this question. These groups are also likely to provide insights into the cumulative effects of compliance inspections and technical assistance visits (groups B and B2) and into what can be considered the "best case" for technical assistance results (group C).

To supplement the available data, provide complementary inputs to the information "triangulation strategy", and in general, help to strengthen the project's conclusions, the consultant team will assess the activity and cost profiles of both technical assistance visits and compliance inspections.

Assessing technical assistance and compliance inspection activity profiles

The interviews are designed to produce activity profiles of technical assistance visits and compliance inspections that will detail what specific activities are conducted and substantive types of information conveyed during both kinds of visits. Doing so will answer questions such as, "How often are compliance inspections conducted with a (non-threatening) compliance and TUR-spirited educational approach like that employed during technical assistance visits?" Assessing the similarities between the profiles of the activities conducted during technical assistance site visits and compliance inspections will help to determine whether the two types of visits can reasonably be expected to produce similar outcomes.

If the activities are similar in that the substance of the information conveyed to the facilities is the same or nearly the same, and the population of facilities being inspected is the same or close to the population of facilities receiving technical assistance visits, then it may be the case that the activities are comparable in both their audience and their influence, and the two sets of activities could be reasonably expected to produce similar results for similar populations.

Assessing technical assistance and compliance inspection cost profiles

The interviews and data provided from DEQ will provide information with which to answer Question 4, "What are the costs (range, per "unit") associated with TU/WRAP and compliance inspections?" The interviews will provide information from which to establish a cost profile for both technical assistance visits and compliance inspections that will enable an approximate "unit" cost (i.e., per visit) or range of costs. Assessing the cost profiles of both compliance inspections and technical assistance visits will explore whether the two sets of activities can reasonably be expected to produce the same results for roughly the same costs. The cost relationship is important to evaluate if decision makers are interested in making fully-informed decisions about the resources that would be needed to use technical assistance activities to achieve compliance program goals.

Bringing it together: Four Hypothetical Results Scenarios

The following hypothetical outcome scenarios illustrate the general analytical approach that will be used to draw conclusions in regards to questions 2-4. Scenarios 1-3 relate to the "pure" target population, group A, and Scenario 4 relates to group B, the "mixed" technical assistance and compliance inspection population. These four scenarios reflect a fraction of the possible outcomes, each of which will depend on what the data "say" about what conclusions can and can not be defensibly drawn.

Each scenario contains six profiles of separate analytical outcomes based on the information collection plan's components. The figures depict examples of possible relationships between and among these profiles and the implications that the relationships will have for the overall analytical findings. The symbols shown in the figures are explained in Figure 5. As the scenarios illustrate, there is a "theme" to how the collected information will be used to draw conclusions about TU/WRAP's effectiveness.

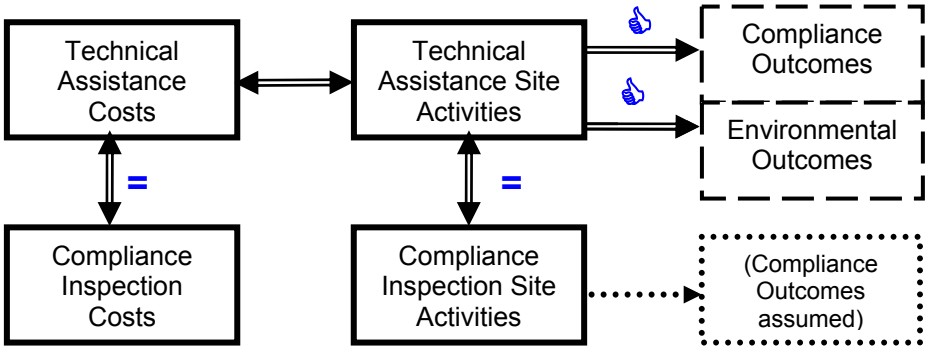
The following scenarios represent four of the many possible results that could be drawn based on the data that will be collected. They provide a hypothetical set of "if…, then…" outcomes that demonstrate how different conclusions could be drawn depending on what the data will indicate.

Figure 5. Results Scenario Symbols

👍	TA has a positive influence that is consistent with compliance program goals
👎	TA has a negative influence that is not consistent with compliance program goals
?	TA has an inconclusive influence—or— Conclusions about the similarities or difference between the activities and/or costs can not be fully drawn
≠	The activities/costs are not sufficiently similar that they can be considered to be equivalent or close substitutes
=	The activities/costs are sufficiently similar that they can be considered to be equivalent or substitutes
< / >	The activities/costs are similar, but are less than/greater than the other

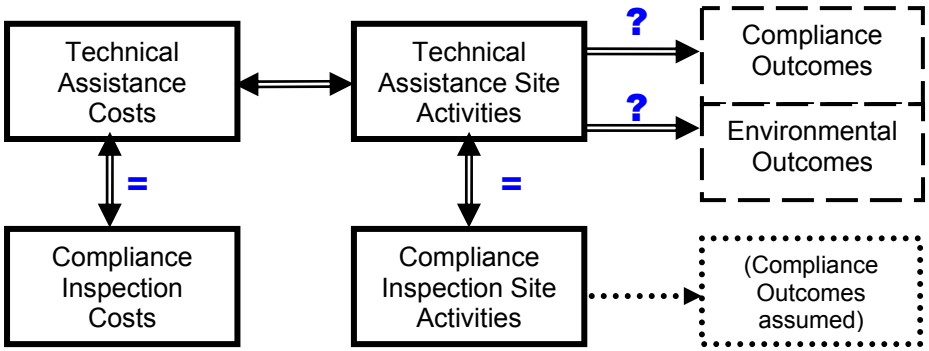
"If…, then" Scenario 1 (conclusions drawn from group A data only): If technical assistance activities alone (not in conjunction with compliance inspections) can be defensibly shown to: (1) favorably influence compliance rates in a manner consistent with the goals of the compliance assurance program, (2) demonstrate positive effects on environmental outcomes, and (3) have similar cost, activity, and population profiles to compliance assistance activities, then technical assistance site visits and compliance inspections overlap to a substantial degree and, for roughly the costs, could be expected to have similar results—compliance as well as environmental performance improvements[5]. This scenario represents the strongest possible case that technical assistance can and does achieve compliance program goals.

Figure 6. Hypothetical Results Scenario 1



"If…, then" Scenario 2 (conclusions drawn from group A data only): The influence of technical assistance visits (alone, not in conjunction with compliance inspections) on compliance and environmental outcomes is inconclusive because the data do not support a clear picture of the relationship. However, the activities and cost profiles of technical assistance and compliance inspections are substantially equivalent and therefore equivalent outcomes can be reasonably anticipated from technical assistance visits. This scenario supports a weaker, yet still defensible conclusion that technical assistance is similar enough to compliance inspections that similar outcomes could be expected if data were available to more completely evaluate those outcomes.

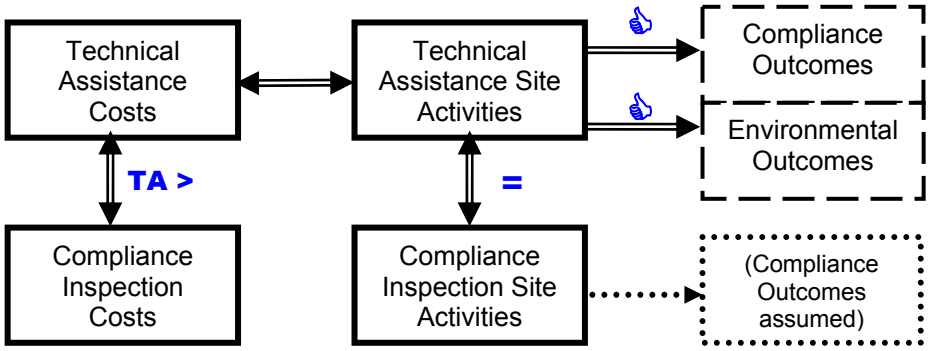
Figure 7. Hypothetical Results Scenario 2



[5] Assuming the technical assistance and compliance populations are sufficiently similar.

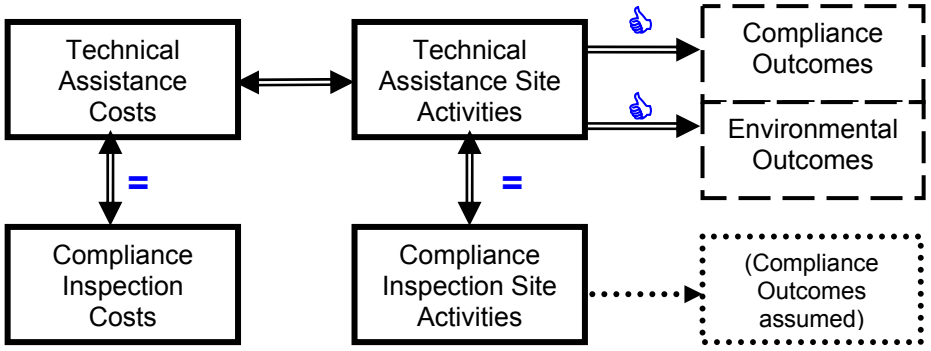
"If…, then" Scenario 3 (conclusions drawn from group A data only): If the influence of technical assistance visits (alone, not in conjunction with compliance inspections) on compliance and environmental outcomes is positive, and the activity profiles are substantially equivalent, but the costs of compliance inspections are on average less (per facility) than the costs of technical assistance. In this scenario, it is important to be careful about drawing conclusions about cost comparisons. Technical assistance activities and compliance inspection activities are often pointed at different populations with different profiles and needs. In that context, direct comparisons can be problematic even though it is still useful to gain a basic understanding of the costs associated with both sets of activities. It is likely that this situation would raise the question of whether additional research around direct cost comparisons is merited.

Figure 8. Hypothetical Results Scenario 3



"If…, then" Scenario 4 (conclusions drawn from group B data only): This is the first scenario to focus on the "mixed" inspection/TA group. This scenario is the same as Scenario 1, except that group of facilities in question received both compliance inspections and technical assistance visits and it is not possible to distinguish between the separate influence of the inspection from that of the TA visit on compliance and environmental outcomes. However, because the activities and costs of compliance inspection and technical assistance were found to be substantially equivalent, the overall conclusions can be the same as in scenario 1 with the caveat that DEQ may want to conduct targeted sampling of the "mixed" inspection/TA visit population to more definitively draw out the effects of conducting both sets of activities on the same set of facilities.

Figure 9. Hypothetical Results Scenario 4



Several other conclusions may present themselves depending on what "story" the data tell.

Questions 1 and 5

The information that will lead to answers for questions 1 and 4 will be a combination of the interviews, post-interview performance measure questionnaires, and the above described analysis that will answer questions 2-4. During the interviews, DEQ and EPA staff will be asked to rank each of the potential performance measures (see the "Crosswalk of Performance Measures…" in the Background Synopsis Paper) with respect to feasibility and priority on a "High/Medium/Low" scale (see Table 3 for an example). The consultant team will compile the results of these rankings and create an overall response table that will resemble the example provided in Table 5 below. This table will also include a column that will, where applicable, say whether each performance measure has been demonstrated to have an established relationship to technical assistance based on the results of the analysis for questions 2-4.

The consultant team will combine the results of the overall response table with the perspective and insights gained through the interviews, as the basis for forming the final recommendations on how TU/WRAP effectiveness should be measured and how TU/WRAP can be integrated with the hazardous waste enforcement program to achieve EPA's Goal 5 compliance improvement objectives. In addition to providing recommendations in these areas, the final report will also provide a discussion of measures based on anecdotal information (e.g., case studies) and an overview of the opinions conveyed by DEQ and EPA on particular measures and approaches.

Table 5. Hypothetical Example of Performance Measure Evaluation

Performance Measure	DEQ Feasibility rank (average)	DEQ Priority rank (average)	EPA Priority rank (average)	Demonstrated relationship to compliance / environmental outcome? (Results of Q2 and Q3)	Overall Response Category (will inform final recommendations)
Number of referrals	High	Low	Low	Inconclusive	Weak Candidate
Toxic chemical use reduced	Medium	High	High	Definitive (positive)	Strong Candidate
Reduced HW generation	High	High	High	Definitive (positive)	Very Strong Candidate
Wastewater safely managed	High	High	High	Inconclusive	Strong Candidate (new data required)
Amt of paint safely disposed of	High	Low	Low	Inconclusive	Weak Candidate

III. Proposed Project Schedule

Below are the proposed dates for approving of the evaluation methodology, collecting the requested information, writing the final report, and presenting the project's conclusions. This schedule allows two weeks for the DEQ staff to collect and provide the basic facility information and another two weeks for the DEQ staff to collect and provide the more targeted detailed information on the subset of facilities that the consultant team will choose for targeted evaluation.

Additional check-in calls can be scheduled as needed.

Finalizing the Evaluation Methodology

- Oral Briefing and feedback sessions (Thurs 1/22/04)
- Final evaluation methodology submitted (Tue 1/27/04)
- Final evaluation methodology approved (Fri 1/30/04)

Information Collection

- DEQ gathers and provides requested basic data to consultant team (by Tue 2/10/04)
- Consultant team submits request for focused data sample (by Fri 2/13/04)
- DEQ staff gather and provide data on focus data sample group (by Fri 2/27/04)
- First interviews with EPA staff (on site in Seattle or by phone with Oregon staff) (week of Feb 9)
- On-site interviews (Portland) with DEQ and EPA Portland-based staff (Tue 2/24/04 and Wed 2/25/04)
- Second interviews with EPA Seattle staff (Thurs 2/26/04 and Fri 2/27/04)
- Call on information collection progress and preliminary ideas for report findings (Tues 3/2/04)

Data Analysis and Report Writing

- Data analysis (2/10/04 through 4/05/04)
- Write report (2/20/04 through 4/30/04)
- Call re: report ideas (Tues 3/9/04)
- Submit report framework (annotated outline of all key ideas and findings) (Thurs 3/18/04)
- Receive feedback on report framework (Wed 3/24/04)
- Submit report draft 1 (Thurs 4/1/04)
- Receive feedback on draft 1 (Wed 4/7/04)
- Submit draft 2 (Mon 4/12/04)
- Oral Briefing (Thurs 4/15/04)
- Submit suggested final changes based on feedback at oral briefing (Tues 4/20/04)
- Final changes approved (Friday 4/23/04)
- Submit final report (Friday 4/30/04)

Appendix A provides a visual overview of the proposed project schedule.

IV. Final Report Outline (Draft)

The outline of the final report will most likely change modestly during the evaluation and analysis stages. The consultant team will ensure that the final outline is approved prior to report drafting and completion. The final report will likely be outlined as described below:

Page Length

Executive Summary 5

1. Background 8
1.1. TU/WRAP Effectiveness Evaluation Background 1.5
1.2. TU/WRAP Overview 3
- TUHWR and TU/WRAP
- Program Logic

Total Estimated Length: 35-45 pages

Appendices:

- Overview of Related Performance Measures
- List of Interviewees
- Compiled responses to performance measure score forms
- Acronyms and Abbreviations
- References

V. Oral Briefing and Presentation of Final Information

The consultant team will give an oral briefing of the final report's conclusions and recommendations after submitting draft 2 of the final report. Draft 2 is intended to be in a final or near final stage except for the feedback at the oral briefing, which will most likely inform and improve the *final* final report.

The consultant team will work with the DEQ and EPA staff to identify who should be at the oral briefing (this group should include all individuals who were interviewed) and to provide copies of the draft 2 report days in advance of the oral briefing. The oral briefing will involve a Power Point presentation of the findings rather than going through the hard copy of the report, though references to sections in the hard copy version will certainly be made.

A rough agenda for the oral briefing, tentatively scheduled for Thursday April 15, is as follows. Participants who wish to skip the background and methods section of briefing could arrive at 2:00 and only stay for the results section and, if desired, the subsequent discussion.

Suggested time: 1:00 – 3:30 pm

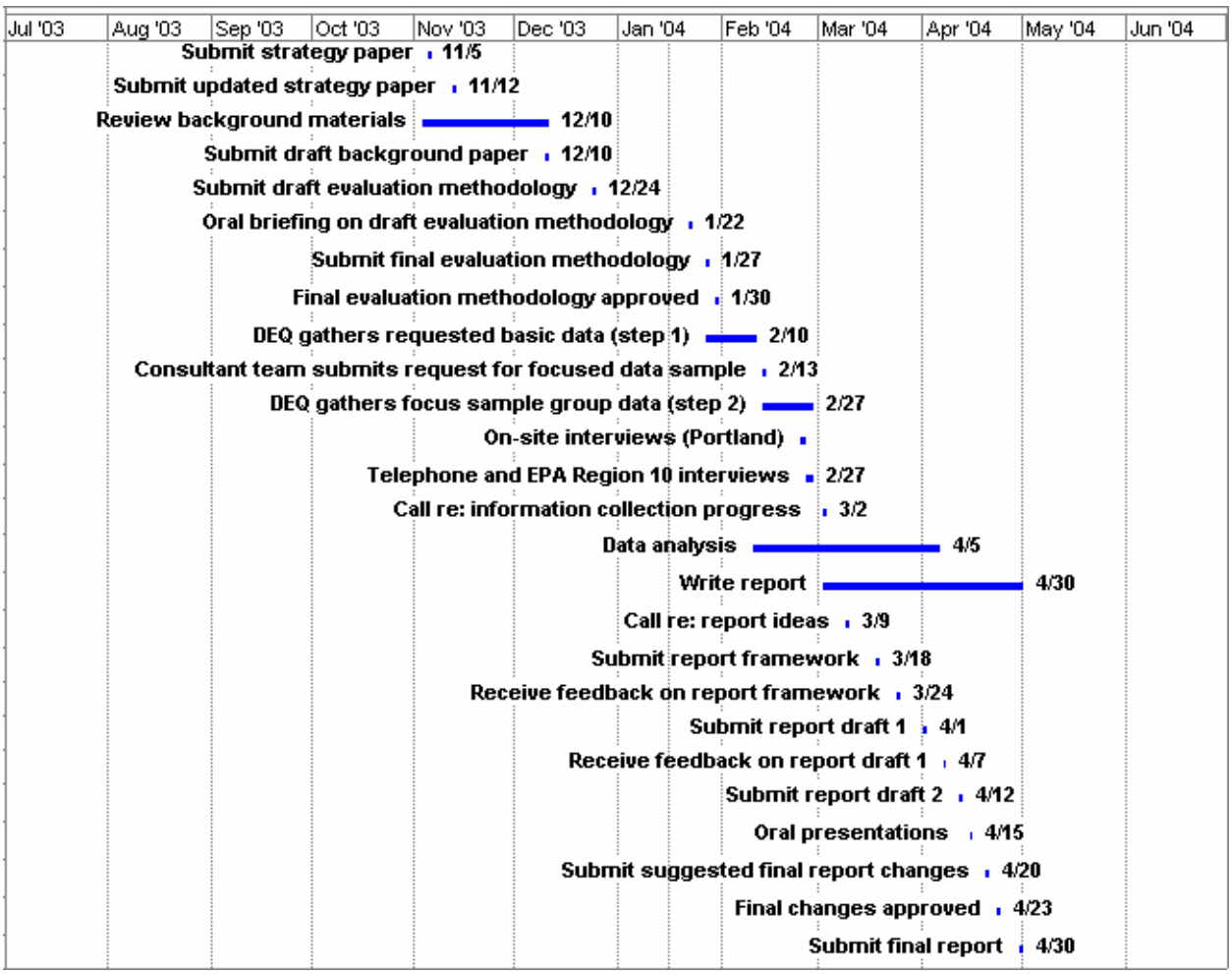
Introductions	15
Background	15
Methods	15
(Break)	(15)
Results, conclusions, and recommendations	30
Feedback/discussion	60

Feedback received at and immediately after the briefing (e.g., via e-mail within an identified time frame) will be incorporated into the final draft. As indicated in the timeline suggested in this plan, the consultant team will first send an e-mail proposing how the feedback will be incorporated into the final report and the content of the proposal will be approved by the principle DEQ and EPA staff prior to making the final changes to the report.

The consultant team will provide the final report in both electronic and hard copy format. Although the exact number of hard copies will be determined later, the consultant team offers at this time to send the following number of reports.

To DEQ:	
Executive Summary	40
Full report	20
To EPA:	
Executive Summary	20
Full report	10

Appendix A: Summary of Proposed Project Timeline



Appendix 2:
Overview of Interviews with DEQ Staff

Appendix 2: Overview of Interviews

TU/WRAP Evaluation: Overview of Interviews with DEQ Staff
March 18-19, 2004

DEQ Staff Interviewed

- Jeff Ingalls (Eastern Region)
- Jeannette Freeman (Eastern Region)
- Gil Hargreaves (Western Region)
- Cheryll Hutchens (Western Region)
- Jay Collins (Northwest Region)
- Andree Pollock (Northwest Region)

Ross & Associates also held shorter interviews with the following DEQ Headquarters staff:

- Anne Price (HQ)
- Rick Volpel (HQ)
- Karen Tarnow (HQ)

The following overview was provided to interviewees prior to the interviews.

Agenda Overview

Topic		Approximate Minutes
I.	Introductions and Background	15
II.	TU/WRAP and Compliance Activities and Resources	65
Break		15
III.	Profiling Exercise	45
IV.	TU/WRAP Effectiveness Measurement	30
V.	Wrap Up and Next Steps	10

Detailed Agenda and Description of Interviews

Interviews will be conducted with DEQ staff to serve the following purposes:

1. To gauge how technical assistance activities are part of DEQ's integrated compliance strategy
2. To more holistically understand how TU/WRAP works;
3. To understand the role of other technical assistance activities besides technical assistance visits;
4. To more holistically understand the relationship between technical assistance activities and "traditional" compliance activities;
5. To characterize the activities conducted during compliance inspections (to gauge the extent to which the TA and inspection activities are similar/distinct);
6. To develop a lifecycle cost profile for technical assistance and compliance inspection activities

7. To discuss ideas about how technical assistance effectiveness could be measured
    a. With currently collected, available data and current performance measures?
    b. If new performance measures were to be introduced that required different data?
8. To explore ideas for how Oregon and Region 10 strategically integrate the TU/WRAP with the authorized hazardous waste enforcement program to achieve EPA's Goal 5 compliance improvement objectives.

Detailed DEQ Interview Agenda

I. Introductions and Background 15

Introductions
Review project goals and evaluation topics
Purpose of interviews
Confirmation of information already received

II. TU/WRAP and Compliance Activities and Resources 65

A. **Overall Compliance "Package"**

Thinking broadly, what are the major components of an effective compliance program?

1. Ultimately, what do the combined components achieve?
2. When does it make sense to use one approach instead of another to achieve compliance (and beyond compliance)?
3. Etc.

B. Technical Assistance Activities

1. Please describe DEQ's/the Region's TU/WRAP approach/strategy (e.g., emphasize SQGs and CEGs, balance site visits with trainings, focus on certain sectors, etc.)
2. Please describe the TA activities other than site visits that you conduct.
3. What kind of follow-up/tracking is done for the activities outlined in the previous question?
4. Please summarize the process for conducting TA site visits
    i. What facilities to target
    ii. What topics to cover (compliance, beyond compliance, other)
    iii. What recommendations
5. Please describe a very effective site visit.
6. Please describe a less effective site visit
7. How do you decide on and conduct TA site visit follow up
8. How is TA follow up information collected?
    i. How do you know about the specific changes made?
9. What do you think makes facilities more or less responsive to TA versus other compliance activities?
10. How does TA lead to closure around compliance issues and questions?

Break (at a good time) 15

C. Compliance inspection practices

1. Please describe DEQ's/the Region's inspection approach/strategy (e.g., why focus on certain facilities, anticipated outcomes, deterrence factor, etc.)
2. How are facilities chosen for inspections?
3. Please summarize the process for conducting a compliance inspection.
4. What kind of follow-up is conducted after an inspection?

D. Relationship Between TU/WRAP Activities and Compliance Inspections

1. What conditions lead DEQ to conduct technical assistance with a facility instead of an inspection (and vice versa?)
2. Please tell us your thoughts on the extent to which the topics covered in inspections are the same as those covered during TA site visits?
3. Are topics covered to the same extent during the two kinds of visits?
    a. What are the major differences?
4. When is TA likely to be more effective than inspections (and vice versa) and why?
5. Please describe when, if ever, compliance inspections later lead to technical assistance and vice versa.

III. Activity Profiling Exercise **45 minutes**

In each 3-hour interview, there will be a profiling exercise that explores the activities and costs associated with TA and inspections, respectively. The emphasis of the exercise will shift from one interview to the next in order to gain the depth possible once all of the interviews have been conducted. For instance, regional interview 1 (afternoon on March 18) will focus on profiling the activities associated with both TA and inspections. Interview 2 (morning of March 19) will take the results from interview 1 and focus on profiling the costs associated with both TA and inspections. Then interview 3 (afternoon of March 19) will verify and supplement the results from interviews 1 and 2.

IV. TU/WRAP Effectiveness Measurement **30 minutes**

The Ross team will begin by spending a few minutes describing the current facets of effectiveness measurement, including the (former) PPA, upcoming PPG, and EPA influences (e.g., Strategic Plan Goal 5, draft OECA guidance). A handout with excerpts from these documents will be provided to facilitate this part of the discussion, which will lead to the following types of questions.

Example (draft) topics:

- Do you think TU/WRAP effectiveness could be measured in a better way using existing data? Why?
- What kind of additional data do you think could be collected to measure TU/WRAP's effectiveness?
- What kind of specific cost information do you think could be tracked to gauge TU/WRAP's cost effectiveness?
- What are your ideas for how DEQ and Region 10 can strategically integrated TU/WRAP with DEQ's hazardous waste enforcement program to achieve EPA's Goal 5?

Within EPA's Strategic Plan, the national enforcement and compliance assurance program is included within Goal 5: EPA will "improve environmental performance through compliance with environmental requirements, preventing pollution and promoting environmental stewardship."

Goal 5 Objectives on improving compliance (5.1): Example 5-year national goals:

1. Compliance assistance (sub-objective 5.1.1)
    - 5 percent increase in number of regulated entities with improved understanding of environmental requirements (5.1.1)
    - 5 percent increase in number of regulated entities that reduce, treat, or eliminate pollution (5.1.1)
    - 5 percent increase in number of regulated entities that improve environmental management practices (5.1.1)
2. Compliance incentives (sub-objective 5.1.2)

- 5 percent increase in number of facilities that use EPA incentive policies to conduct environmental audits of other actions that reduce, treat, or eliminate pollution or improve environmental management practices (5.1.2)

3. compliance monitoring and enforcement (sub-objective 5.1.3)
   - 5 percentage point increase in percent of enforcement actions requiring improvement of environmental management practices (5.1.3)

Appendix 3:
Draft DEQ Deterrence Report Introduction

INTRODUCTION

Current Regulatory Focus on Enforcement

In their efforts to administer pollution-control laws, the U.S. Environmental Protection Agency and its counterpart state agencies have tended to employ command-and-control type strategies with a focus on inspections and enforcement. Policymakers generally assume that enforcement is the most critical regulatory tool because penalties "deter" future violations. However, agencies generally lack sufficient information to determine whether enforcement is the best foundation for a compliance program compared to other kinds of activities, and how enforcement should be implemented to best take advantage of a deterrent effect.

Like many states, Oregon's Department of Environmental Quality (DEQ) uses a compliance strategy that includes both enforcement and non-enforcement tools. Its permit and facility inspection programs and complaint-response investigation programs involve enforcement to create deterrence. But DEQ also uses various non-enforcement cooperative efforts to build relationships with entities in the regulated community. Depending on the type of program and the amount of interaction with the facility, DEQ believes these efforts can create compliance in a less expensive and less adversarial manner than enforcement. It also believes that through these efforts, it can contact people who would probably not otherwise receive attention and stimulate environmentally protective behavior above and beyond that required by law.[1]

Not everyone agrees on what the appropriate mix of enforcement and non-enforcement tools should be.[2] Environmental groups typically suggest that environmental agencies should increase enforcement.[3] Business interests are typically concerned that enforcement is unnecessarily

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[1] *See* Keiner, Suellen, Brenda Hagman and Bernard Penner, *Environmental Compliance Consortium's Response Compass*, ECOSTATES, pg 24-29 (summer 2001) (describing how states like Oregon integrate various enforcement tools (*e.g.*, administrative and civil enforcement, criminal prosecution) with non-enforcement tools (*e.g.*, warnings, technical assistance, public education, sectoral outreach, voluntary programs, amnesty programs, performance assistance, and economic incentive programs)).

[2] DEQ published an article in an industry journal explaining the enforcement process and the steps a company should take in an enforcement action. Les Carlough, *DEQ Enforcement: Facts v. Fiction*, Oregon Insider, Issue #167, Dec. 15, 1996, at 1. An anonymous industry representative published a criticism in the journal suggesting that DEQ should conduct a cost-benefit analysis of the dollars spent by DEQ, state lawyers, state police, district attorneys, and the court systems to see if the penalties collected justify the expense of taxpayer-funded enforcement. *DEQ Enforcement: A Response, Oregon Insider*, Issue #167, Jan. 1, 1997, at 6. This drew a second criticism from a public-interest environmental attorney, who doubted that DEQ's enforcement is sufficient to deter noncompliance. Craig N. Johnston, *DEQ Enforcement Criticism Critiqued*, Oregon Insider, Issue #168, Jan. 15, 1997, at 7. DEQ responded in a follow-up article suggesting some factors anyone trying to measure deterrence should consider. Les Carlough, *DEQ Enforcement: In Perspective*, Oregon Insider, Issue #169, Feb. 1, 1997, at 5.

[3] *See, e.g.*, Coequyt, John and Richard Wiles, *Prime Suspects: The Law Breaking Polluters America Fails to Inspect*, Environmental Working Group (July 25, 2000) available at www.ewg.org ("EPA has lost control of environmental law enforcement, and in the absence of strong federal oversight many states have gutted enforcement programs." *Also*, Oregon Environmental Council; *Holding Polluters Accountable: Strategies for Strengthening Enforcement of Environmental Laws in Oregon*, March 2002 (concluding that Oregon's illegal polluters are not deterred because they do

aggressive, but have sometimes opposed technical assistance efforts fearing that larger companies will pay a disproportionate share of the costs and that state-supplied assistance is unfair to companies that spend their own resources to attain compliance.[4] EPA has been cautious about supporting technical assistance which may draw resources away from enforcement programs. As a result of these conflicts, state environmental agencies have had difficulty obtaining full acceptance of technical assistance efforts[5] – and enforcement has remained the primary regulatory tool and the numbers of enforcement cases and penalties assessed remain a primary measure of success.

It is clear that enforcement numbers and counts do not show whether a particular mix of tools is the best at improving compliance in the regulated public or whether the mix creates the best environmental return for the dollars spent. EPA, in exercising its oversight of state programs, increasingly acknowledges the value of non-enforcement tools,[6] but insists that states maintain an aggressive enforcement presence.[7]

Shifting to an Integrated Approach

In 1997, EPA developed a National Performance Measures Strategy (NPMS) to address current trends in government that obligate agencies to (1) manage resources with results-based strategies and

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not face certainty of getting caught, that penalties are too low, and that there are insufficient other incentives to encourage compliance).

[4] *E.g.*, VOLOKH, ALEXANDER AND ROGER MARZULLA, REASON FOUNDATION, ENVIRONMENTAL ENFORCEMENT: IN SEARCH OF BOTH EFFECTIVENESS AND FAIRNESS, Policy Study no. 210 (Aug. 1996) (concluding that enforcement penalties as currently applied are ineffective and inappropriate); Anonymous contributor, *DEQ Enforcement: A Response, Oregon Insider*, Issue #167, Jan. 1, 1997, at 6 (stating that DEQ's enforcement program is unnecessarily aggressive and creates "fear and major damages to employment;" and that in other regulatory systems "there is a sense of working together to solve the problem, lowering the cost to all, and getting better long-term results for the environment").

[5] Currently, technical assistance is not recognized as part of the federally delegated hazardous waste program and the state is not credited for resulting increases in compliance or waste reduction from these efforts. The Oregon Legislature recently instructed DEQ to negotiate with EPA for the purpose of gaining acceptance of technical assistance as a part of the delegated hazardous waste program. Senate Bill 196, 72nd Legislative Assembly, regular session (2003).

[6] *Compare, Steve Herman, Message from the Assistant Administrator, in* ANNUAL REPORT ON ENFORCEMENT AND COMPLIANCE ASSURANCE ACCOMPLISHMENTS IN 1999, OFFICE OF COMPLIANCE AND ENFORCEMENT (2000) ("The goal of our program is to provide a credible deterrent to pollution and greater compliance with the law.") *with, John Peter Suarez, Message from the Assistant Administrator, in* ENVIRONMENTAL RESULTS THROUGH SMART ENFORCEMENT: FISCAL YEAR 2002 ENFORCEMENT AND COMPLIANCE ASSURANCE ACCOMPLISHMENTS REPORT, OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE (2003) ("Our goal is to implement a smart enforcement program that delivers environmental results. A smart program uses a mix of integrated strategies, partnerships and innovative approaches to provide cleaner air, purer water and better protected land.")

[7] Performance Partnership Agreement between the Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency – Region 10 for July 1, 2002 - June 30, 2004, *available at* www.deq.state.or.us/about/ppa.pdf . (DEQ agrees to conduct inspections to ensure high rates of compliance, track significant non-compliers, evaluate EPA's concern that DEQ's penalties are too low and evaluate EPA's concern that DEQ does not assess sufficient penalties in multiple-violation circumstances.)

(2) demonstrate that agency resources are used efficiently.[8] The new set of measures was intended to supplement the counts of inspections and penalties and allow credit for work in alternative non-enforcement and incentive-based programs. An important, but unstated goal of the NPMS was to create a means to compare outcomes of the various alternative tools so that agencies could determine which tools were most efficient and effective in achieving the best environmental return.[9] A problem, recognized during development of the NPMS, is that the environmental benefits of some tools are difficult to quantify.

Performance Measure no. 2 of the NPMS addresses environmental or human health improvements resulting from enforcement actions, but there are significant complexities in how environmental benefit of enforcement should be measured. Some parts may be relatively simple, for example, the amount of pollution directly deflected from the environment by the requirements of the enforcement action. Some parts may be moderately difficult to measure, for example, the pollution that will be deflected from the environment in the future because the violator will be less likely to violate (*i.e.*, "specific deterrence"[10]). Some parts may be essentially impossible to measure, for example, the pollution that will be deflected from the environment in the future because someone else learns of the enforcement action and is inhibited from violating (*i.e.*, "general deterrence"[11]). In developing the NPMS, EPA requested comment on how to integrate a measure of deterrence.[12] But a means to measure general deterrence eluded EPA and the agency did not include it in the final strategy. General deterrence – the lynchpin of current national and state environmental regulatory strategy – is not addressed in any way by the National Performance Measures Strategy.

What is Deterrence?

Many intuitively believe that people and businesses tend to comply only to the extent that the personal or business benefits of compliance outweigh the personal and business costs. In this view, people would be willing to take actions that create personal or business benefit when the costs are personally minimized by being diffused or distributed to the greater population.[13] This perspective bears itself out in areas of our common experience. For example, many people drive to work alone even though we all know that the multitude of cars on the roads creates public problems of clogged highways and increased air pollution. Each driver considers the convenience of having his or her own car available for personal errands to be more valuable than the personal detriment of the one

[8] US EPA, Office of Enforcement and Compliance Assurance, Measuring the Performance of EPA's Enforcement and Compliance Assurance Program: Final Report of the National Performance Measures Strategy (Dec. 22, 1997).

[9] *See* Herman, Steven A., *Innovations in Environmental Enforcement and Compliance*, NATIONAL ENVIRONMENTAL ENFORCEMENT JOURNAL, pg 6 (Feb. 1999).

[10] Nagin, Daniel (1978) General Deterrence: A review of the empirical evidence. *In* A. Blumstein, J.Cohen, and D. Nagin (eds.), DETERRENCE AND INCAPACITATION: ESTIMATING THE EFFECTS OF CRIMINAL SANCTIONS ON CRIME RATES, 95-139, Washington, D.C., National Academy of Sciences.

[11] *Id.*

[12] Notice of Public Meeting on the National Performance Measures Strategy for Enforcement and Compliance Assurance, 62 Fed. Reg. 8014-16 (Feb. 21, 1997).

[13] *See, e.g.*, Hardin, Garrett, *The Tragedy of the Commons*, SCIENCE 162:1243-48 (1968).

added car on the road. For each person, the environmental detriment is small and distributed to the greater public through impacts to shared roads and air. But the aggregate effect of millions of decisions to drive creates rush-hour traffic jams and smog. This has become known as the "tragedy of the commons"[14] and plays itself out in many aspects of environmental management.

How does a government motivate people and businesses to make decisions that avoid these detrimental effects? The current paradigm is that the government must act to "deter" violation by setting laws that require certain conduct, then enforcing those laws by penalizing noncompliance.[15] The penalty becomes a larger personal cost which is not as easily distributed to the greater population. When people make decisions, they consider the risk of penalties and other negative consequences of prior decisions made by themselves or others. Classic deterrence theory holds that, to achieve maximum deterrence, an enforcement program must demonstrate three principles.[16] First, detection and penalty must be *certain* if the illegal conduct is undertaken. Second, the *severity* of penalties must exceed the benefit resulting from the illegal conduct. Third, penalties must be swiftly applied, a factor termed "*celerity*." The classical theory assumes that a would-be violator must perceive these risks associated with the illegal conduct and react in a rational manner. Whether this model of deterrence governs compliance decisions in the area of environmental law is not well understood.

Despite the lack of supporting evidence and proven reliability of the classic deterrence model as applied to environmental regulation, EPA and its state counterparts created and continue to maintain regulatory programs fundamentally based around the concept that inspections and enforcement are the essential and primary elements needed to stimulate compliance in the regulated public.

OBJECTIVES AND METHODS

The primary objectives of this study were to determine whether and what aspects of inspections, penalties and other enforcement tools are most important in creating general deterrence; and whether general deterrence is the critical factor in stimulating overall compliance.

This study is based on two surveys of the opinions and beliefs of the regulated community. The surveys were designed in cooperation with, and were executed by, the Market Decisions Corporation.[17] The first survey was given to individual Oregon residents to understand community perspectives about compliance, violations and enforcement. By examining public opinion, the study sought to characterize the cultural norms in which regulated entities make their compliance decisions and the possible community pressures that may promote compliance. A second study sought to understand what motivates people and businesses to comply by comparing their awareness of

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[14] *Id.*

[15] *Id.* (mutual coercion, mutually agreed upon).

[16] Beccaria, Cesare, (1986) On Crimes and Punishment. (D. Young, Trans.). Indianapolis, IN; Hackett Publishing. (original work published 1764), cited in Myers, David L., Excluding Violent Youths from Juvenile Court: The Effectiveness of Legislative Waiver. Ph.D. Dissertation, University of Maryland (2001).

[17] Warren Beymer, Project Manager for Market Decisions Corporation, 8959 SW Barbur Boulevard in Portland, Oregon, 97219 (phone 503-245-4479).

regulatory requirements, DEQ compliance efforts, and the risks and consequences of noncompliance; against their perspectives about environmental stewardship, economic challenges, and effectiveness of regulatory oversight.

Executing the Public Survey[18]

The survey of the general public was completed first. Three hundred (n=300) interviews were conducted with Oregon residents between February 6 and February 25, 2001. All respondents were screened to have responsibility, or share responsibility, for their household's decisions in environmental areas such as automotive, waste disposal, and energy use.

A random probability sample was utilized in order to achieve results projectable to all residents of Oregon. Oregon residents were randomly chosen using random digit dialing (RDD). Using RDD, telephone numbers are generated by computer using known area codes and prefixes with the remaining four digits randomly selected within known working blocks of residential numbers. This technique provides the most representative sample of the population in the sampling frame. Non-response bias is minimized because RDD does not exclude people with unlisted telephone numbers or people who have recently moved or have been given new telephone numbers. Around 30% of households have unlisted telephone numbers, and these people would have been excluded without RDD sampling. To further minimize non-response bias, interviews were conducted between 5:00 p.m. and 9:00 p.m. Monday through Friday and on weekends between 11:00 a.m. and 7:00 p.m.

Geographic quotas were established to allow for meaningful comparisons between regions of the state. One hundred (n=100) interviews were conducted in the Eastern, Northwest and Western regions of the state. Although these sample distributions do not perfectly match the population proportions of the state, they allow for meaningful comparisons between regions by ensuring a statistically valid sample size in each region.

The total sample of Oregon residents yields a maximum sampling variability of ± 5.7% at the 95% confidence level. The range itself is expressed as a plus-or-minus value (*e.g.*, ± 5.7%), which means that the sampling variability actually covers a range of 11.4%. For example, with a sample size of 300, for a 50% response, the sampling variability is not more than ± 5.7%, that is, the response would fall within the range of 44.3% and 55.7% (50% ± 5.7%) in 95 out of 100 surveys. Note that the sampling variability is higher for each of the geographic regions (± 9.8% at the 95% confidence level for each geographic region).

Maximum sampling variability @ the 95% confidence level:					
	Response Percentage				
	50%	**40% or 60%**	**30% or 70%**	**20% or 80%**	**10% or 90%**
Total (n=300)	± 5.7%	± 5.5%	± 5.1%	± 4.5%	± 3.4%
Eastern (n=100)	± 9.8%	± 9.6%	± 8.9%	± 7.8%	± 5.9%
Northwest (n=100)	± 9.8%	± 9.6%	± 8.9%	± 7.8%	± 5.9%
Western (n=100)	± 9.8%	± 9.6%	± 8.9%	± 7.8%	± 5.9%

[18] *See* Appendix I – Public Survey.

Executing the Company Survey[19]

Four hundred fifty (n=450) telephone surveys were conducted between June 19 and July 9, 2002 with a random selection of companies regulated by DEQ. All responding individuals were screened to have responsibility, or to share in the responsibility, of making business decisions regarding environmental rules and regulations for their facility. Although some companies in the database have multiple facilities, only one interview was completed per company, as the primary survey questions pertain to company-wide decision making. Although this paper uses the word "company" to describe all respondents, some respondents are sole proprietors and others are government or semi-governmental entities.

Interviews were conducted between 8:00 a.m. and 5:00 p.m. Monday through Friday to reach respondents during their daily working hours. Multiple attempts were made to reach each respondent and interview times were set at respondents' convenience whenever possible. All respondents were carefully and repeatedly informed that the survey was confidential and information about their company would not be shared with DEQ or anyone else.[20] If requested, a letter from DEQ was emailed or faxed to respondents to confirm that DEQ commissioned Market Decisions Corporation to conduct this independent and confidential research on the agency's behalf.

Two important factors affected the choice of target universe for the survey. First, only a very small portion of all Oregon companies conduct activities pervasively regulated by DEQ[21] so, while random sampling of all Oregon companies would hypothetically allow conclusions to be drawn about the behavior of all Oregon companies, statistically significant results would have required a very large sample population. Second, there are entities other than "companies" which are regulated by DEQ including sole proprietors, trusts, semi-governmental and government entities – there is no cumulative list of these from which a sample could be drawn. Therefore, to create statistically significant results using a wide variety of entities that interact with DEQ regularly, the survey sample frame included only those 9,529 entities (herein "companies") registered in DEQ's databases. It should be noted that, as a consequence, conclusions of this study may not characterize the behavior of entities that evade permits or registrations.

Another goal of this research was to achieve actionable, projectable results within each type of regulation category. In order to achieve this goal, some groups were removed from the sampling frame. We chose one discrete group comprised of the most important pollutant sources and one discrete group representing less significant pollutant sources each from DEQ's Water Quality Division (*i.e.*, NPDES[22] and WPCF[23]), Air Quality Division (*i.e.*, Title V[24] and ACDP[25]) and the

[19] *See* Appendix II – Company Survey.

[20] See Company Survey in Appendix II.

[21] Approximately 150,000 foreign and domestic corporations, limited liability companies and limited-liability partnerships have filed with the Oregon Secretary of State Corporations Division, not including other types of entities, *e.g.*, sole proprietors, trusts, semi-governmental entities and governments. Business Report: Monthly update from Oregon's Secretary of State Bill Bradbury (Sept. 2003) available at www.filinginoregon.com/statistics/2003/0903.pdf.

[22] National Pollutant Discharge Elimination System (NPDES) permits are issued to sources that discharge wastes into navigable surface waters by DEQ pursuant to its delegated authority under the federal Clean Water Act. Specifically, the

Land Quality Division's Hazardous Waste Program (*i.e.*, LQG[26] and SQG[27]). While vital to DEQ's regulatory efforts, other sub-categories were eliminated in the interest of statistical integrity of the groupings. (*See* shaded grey in Table A below.)

Table A. Summary of the Company survey sample frame			
	Large	Small	Other[28]
Water *(n=6767)* *(1665 NPDES major and WPCF only)*	**NPDES Major** *(n=521)*	**WPCF** *(n=1144)*	**Other NPDES** *(n=5102)*
Air *(n=945) (945 Title V & ACDP only)*	**TITLE V** *(n=127)*	**ACDP** *(n=818)*	
Land (Hazardous Waste) *(n=1817) (941 LQGs & SQGs only)*	**LQG** *(n=329)*	**SQG** *(n=612)*	**CEG**[29] *(n=876)*
Other *(n=3149)*			**Other**[30] *(n=3149)*

Minimum quotas were established to ensure a statistically valid sample size in each regulation category and sub-category, in order to allow for meaningful comparisons. Although the proportions of each regulation category and sub-category in the sample do not exactly match the actual

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study targeted NPDES "majors" which are those sources that discharge large amounts of waste, discharge toxic pollutants, serve more than 10,000 people, or for other reasons need special regulatory control.

[23] Water Pollution Control Facility (WPCF) permits are issued to sources that dispose of wastewater through land application, evaporation or any means other than discharge to navigable surface waters.

[24] Oregon Title V Operating Permits (Title V) are issued to industrial sources that have the potential to emit more than 100 tons of certain non-toxic pollutants, 10 tons per year of any single hazardous air pollutant (HAP) or 25 tons of any combination of HAPs per year. The permits are issued by DEQ pursuant to its delegated authority under Title V of the federal Clean Air Act.

[25] Air Contaminant Discharge Permits (ACDPs) are issued to sources that emit air contaminants in sufficiently large amounts as to necessitate special regulatory control, but not large enough to require a Title V permit. Air Contaminant Discharge Permits are state permits but part of the State Implementation Plan prepared pursuant to the federal Clean Air Act.

[26] A generator of hazardous waste must register with DEQ as a Large Quantity Generator of Hazardous Waste (LQG) if it generates more than 2,200 pounds of hazardous waste in a calendar month or accumulates more than 2.2 pounds of acutely toxic hazardous waste on site.

[27] A generator of hazardous waste must register with DEQ as a Small Quantity Generator of Hazardous Waste (SQG) if it accumulates more than 2,200 pounds of hazardous waste on site or generates more than 220 pounds but less than 2,200 pounds of hazardous waste in a month.

[28] Other regulated sub-categories (shaded) were excluded from the sampling frame

[29] Conditionally Exempt Generator

[30] Entities holding certificates, licenses, or other permits with DEQ including: solid waste disposal permittees, underground storage tanks operating permittees, on-site septic system installers and service providers, and others.

proportions of the sampling frame, they allow for meaningful comparisons between categories by ensuring a statistically valid sample size in each.[31]

Table B below shows completed surveys ("completes") by segment and the associated sampling variability. Note that some companies may be included in multiple regulation categories. The total sample of companies in major DEQ regulation categories yields a maximum sampling variability of ± 4.3% at the 95% confidence level. The range itself is expressed as a plus-or-minus value (*e.g.*, ± 4.3%), which means that the sampling variability actually covers a range of 8.6%. For example, with a sample size of 450, for a 50% response, the sampling variability is not more than ± 4.3%, that is, the response would fall within the range of 45.7% and 54.3% (50% ± 4.3%) in 95 out of 100 surveys. Note that the sampling variability is higher for each of the regulation categories and sub-categories.

Table B. Summary of the maximum sampling variability at the 95% confidence level for various response percentages.

	Response Percentage				
	50%	**40% or 60%**	**30% or 70%**	**20% or 80%**	**10% or 90%**
Total (n=450)	± 4.3%	± 4.2%	± 4.0%	± 3.5%	± 2.6%
Water (n=214)	± 6.2%	± 6.1%	± 5.7%	± 5.0%	± 3.8%
NPDES (n=91)	± 9.3%	± 9.2%	± 8.6%	± 7.5%	± 5.6%
WPCF (n=131)	± 8.1%	± 7.9%	± 7.4%	± 6.5%	± 4.9%
Air (n=137)	± 7.8%	± 7.6%	± 7.1%	± 6.2%	± 4.7%
Title V (n=30)	± 15.7%	± 15.4%	± 14.4%	± 12.6%	± 9.4%
ACDP (n=109)	± 8.8%	± 8.6%	± 8.0%	± 7.0%	± 5.3%
Land (n=149)	± 7.4%	± 7.2%	± 6.8%	± 5.9%	± 4.4%
LQG (n=58)	± 11.7%	± 11.4%	± 10.7%	± 9.4%	± 7.0%
SQG (n=92)	± 9.4%	± 9.2%	± 8.6%	± 7.5%	± 5.7%

Data Collection

All interviews were conducted using computer-aided telephone interviewing (CATI) software. This CATI system allows the interviewer to administer the questionnaire one question at a time via computer. This ensures each question is asked at the appropriate time during the survey and that respondents are automatically directed to the appropriate questions during complex skip patterns. Pre-coded responses are programmed so interviewers can simply "check" the answer and move to the next question. The CATI software allows interviewers to record verbatim or "other" (responses that do not fit into pre-coded choices) responses and enter numeric values. The software also ensures that responses cannot be out-of-range or illogical (*i.e.*, percentages adding to more than 100% or saying "don't know" while also giving another answer). In addition, the CATI software is used to manage all quotas, callback appointments and sample distribution. All data for complete and

[31] The responses of some companies may be included in the results for multiple DEQ categories and sub-categories. For example, one company can be included in NPDES and WPCF, but would only be counted once in the Water category and once in the total. No company is represented more than once within a single category or total.

incomplete surveys is entered into the project database in real time and is immediately available for review and analysis.

All telephone interviews were conducted from Market Decisions Corporation's in-house telephone facility and all surveys were edited by quality editors as they were completed. Additional supervisors monitored interviews to insure that questions were listened to and understood as intended. Interviewers were screened upon application, trained to meet standards of performance and signed agreements of confidentiality. In addition, all interviewers received training specific to conducting interviews for this project.

After all data was entered and reviewed, open-ended (verbatim and "other" responses) questions were coded. A code was set for any response reaching a frequency of 2% - 3%. After coding was completed, data was tabulated for analysis and reporting.

After removing duplication in companies involved in multiple DEQ regulation programs, a total of 2,655 Oregon businesses remained for interviewing. All companies received a telephone call in attempt to complete an interview. The average number of attempts was two per company and the number of attempts ranged from one to eleven, depending on availability and appointment scheduling. Using Advertising Research Foundation (ARF) formulas, the net response rate for the business audience was 17% and the cooperation rate was 68%.[32]

[32] The ARF formulas, simply stated, are: Response Rate = Completed interviews / (completed interviews + non-completed interviews – ineligible records) and Cooperation Rate = Completed interviews / (completed interviews + refusals). See, Survey Response Definitions, Theodore F. Dunn, Ph.D., The Advertising Research Foundation, 1999.

Appendix 4:
DEQ TUWRAP Site Visit “To Do” List

DEQ Waste Reduction Assistance Program (WRAP) Site Visit "TO DO LIST"

Facility Name: _____ **Please Return Completed Form By:** ____/____/____

Facility Address: _____ **County:** _____

Facility ID #: _____ **Field Generator Status:** _____

Facility Rep: _____ **DEQ Rep:** _____

Facility Rep Phone: _____ **DEQ Rep Phone:** _____

Date of Visit: _____/_____/_____ **SIC Code:** _____ **DEQ Regional Office:** _____

Hazardous Waste Determination:	**Done**	**Not Done**

Facility Comments: _____

Waste Management:	**Done**	**Not Done**

Facility Comments: _____

Product Management Recommendations:	**Done**	**Not Done**

Facility Comments: _____

Record Keeping & Reporting:	**Done**	**Not Done**

Facility Comments:

_____

Contingency Planning/Spill Response:	**Done**	**Not Done**
.		

Facility Comments:

_____

Training:	**Done**	**Not Done**

Facility Comments:

_____

Facility Copy - White
Return Copy -Yellow
DEQ Copy - Pink.

DEQ WRAP Site Visit "TO DO LIST" **Facility ID #_____**

Used Oil:	**Done**	**Not Done**

Facility Comments: _____

TUR PLAN CONTAINS	**YES**	**NO**	**TUR PLAN CONTAINS**	**YES**	**NO**	**Done**	**Not Done**
1. Policy statement	___	___	5. Cost Assessment	___	___	1	
2. Toxic/HW Analysis/Assessment	___	___	6. Employee Program	___	___	2	
3. Reduction Opportunities	___	___	7. Plan Incorporation Efforts	___	___	3	
4. Reduction Goals	___	___	8. Update Annual Progress	___	___	4	

Recommendations:	5
	6
	7
	8

Facility Comments:

TUR, Waste Minimization & Pollution Prevention Recommendations:	**Done**	**Not Done**

Facility Comments: _____

Baseline TUR, Waste Minimization & Pollution Prevention Activities Already in Place:

Other Program Referrals:	**Done**	**Not Done**

Facility Comments: _____

Other Recommendations/Issue Areas:

Facility Comments:

Appendix 5:
Example Eastern Region Technical Assistance Site Visit Follow-up Letter

December 17, 2003

Re: Technical Assistance Site Visit Summary

Dear [Sir]r:

This letter is a follow-up to the technical assistance visit [XX] and I conducted, at [your facility]. The purpose of our visit was to provide you technical assistance on hazardous waste regulations and, if practicable, identify potential waste reduction opportunities. You in turn provided us the opportunity to make this technical assistance visit a learning opportunity for the Eastern Region's new technical assistance employee, [XX]. We appreciate you, and [your facility] allowing us to conduct this visit at a slower pace to provide ample time to explain and discuss regulatory issues with [XX].

[Your facility] is registered with Department of Environmental Quality (DEQ) as a hazardous waste generator. It was determined that your generator category fluctuates between small quantity generator and large quantity generator. However, this last year, 2003, you have been able to maintain small quantity generator status for the entire year. This visit clearly determined that your generator status currently is that of a small quantity generator, generating between 220 pounds and 2,200 pounds of hazardous waste per month.

The brief review of your manifest records for 2003 indicated that it is likely that [your facility] could and does maintain conditionally exempt generator status (less than 220 pounds/ month) on many months of the year. However, due to your twice annual cleaning of your 25 gallon solvent tank in the paint shop, it is unlikely that you can maintain conditionally exempt generator status for a complete calendar year. Consequently, this technical assistance visit evaluated [your facility] for compliance with the small quantity generator hazardous waste regulations.

Hazardous Waste Determinations

Regulations require all generators of hazardous waste from conditionally exempt generators to large quantity generators to determine if the solid wastes they generate are hazardous wastes. [your facility] appears to be conscientious about making hazardous waste determinations, and appeared to have made waste determinations on the many and various waste streams observed and discussed during this visit. However, in the paint area where listed solvents are being used to clean equipment and parts, wipes and cardboard are coming in contact with your F003 and F005 listed solvent and the resulting contaminated wipes and cardboard are being improperly disposed of as solid waste.

There is currently a **proposed** rule that will conditionally exempt wipes from hazardous waste regulation. This EPA proposed rule is currently taking comments on conditionally exempting both solvent contaminated sorbents and wipes. It is my opinion that this exemption once a final rule will only include wipes; however, once final I will certainly inform [your facility] of the

final rule determination. In the meantime you must manage any wipes or sorbents that are contaminated with your F003 and F005 listed solvent as hazardous waste. I will discuss this rule making in more detail later in this summary.

Required action:
Immediately begin managing wipes and sorbents that have been contaminated with F003 and F005 listed solvent as hazardous waste. The waste codes associated with these non-liquid wipes and sorbents would include F003, F005 and D035. As the waste wipes and cardboard sorbents are non-liquid the ignitable characteristic D001 would no longer apply.

Waste Management
[Your facility's] waste management activities appear to be in significant compliance with the hazardous waste small quantity generator requirements set forth in 40 CFR 262.34(d). Observations made during this visit did not identify container management as an issue. Containers were properly labeled with the words "hazardous waste" and when appropriate, were labeled with an accumulation start date. Containers storing hazardous waste were found to be in good condition and closed. Storage did not exceed the 180 day time frame for small quantity generators. Adequate aisle space was provided for hazardous waste containers in storage and [the facility] was conducting and logging weekly inspections of their hazardous waste storage area.

* A discrepancy of the small quantity generator rules found in 40 CFR 262.34(d)(5)(ii) was observed in the hazardous waste storage area. This rule requires small quantity generators to post certain information next to the telephone in the hazardous waste storage area. The information required by rule includes; the name and phone number of the emergency coordinator, an emergency phone number (in your case the guard shack and 911), and the location of fire extinguishers and spill control material, and if present fire alarms.

Required action:
You must post this required information next to the phone in your hazardous waste storage area. It would be a good idea to post this same information in the paint storage room.

Other Waste Management
Satellite Accumulation

- [Your facility] operates a few Satellite accumulation areas. Satellite accumulation is currently being used for aerosol can residue and for solvent waste in the paint room. As we discussed during this visit; satellite accumulation containers must be at or near the point of generation and under the control of the operator, you can not store more than 55 gallons of hazardous waste in a satellite accumulation area; once a satellite accumulation container has reached 55 gallons, an accumulation start date must be placed on the container and the container, once full, must be removed from the satellite accumulation area to your hazardous waste storage area within 3 days. For compliance with satellite accumulation rules you must also label the container with the words "hazardous waste" or a description of the contents of the drum, keep the container closed when not actively managing hazardous waste and only store wastes that are compatible with the container.

It appeared at the three satellite areas we observed that [your facility] was in substantial compliance with these rules.

In a letter to [your facility] from [Mr. X], DEQ Hazardous Waste Technical Assistance Program, the Department stated that we did not take issue to the satellite accumulation area for Wrap Division's solvent waste being at the Paint Product storage area. I did not specifically look into this situation during this visit; however, [your facility] should maintain a copy of [Mr. X's] letter on file. By doing this you should avoid any potential compliance issue regarding the interpretation of what constitutes "at or near the point of generation." I will look at the satellite accumulation area in Wrap Division the next time I visit your facility and determine if I concur with [Mr. X's] findings and discuss with you how an EPA federal inspector may look at the situation.

Universal Waste

- [Your facility] is managing their mercury containing fluorescent tubes as Universal Waste. However, because this inspection was limited to approximately 3 hours we did not have time to physically inspect [your facility's] universal waste storage area. However, we did discuss briefly what is required to comply with the universal waste rules as they apply to spent fluorescent tubes. I explained that the universal waste regulations require that containers used to contain universal waste; must be kept closed; must be labeled with one of the following phrases: "Universal Waste – Lamps", "Waste Lamps," or "Used Lamps;" must be labeled with an accumulation start date, and must be stored in a manner that prevents breakage. I explained that cardboard boxes are fine for the storage of spent fluorescent tubes; however, the boxes must be kept closed and when full must be taped or sealed at each end.

Required action:

At this time no required action is necessary with regard to your satellite accumulation areas and universal waste management areas. However, we did discuss a few things with regard to waste management in satellite accumulations areas. Weekly inspections of satellite accumulation areas are not required by the regulations; however, routine inspections of satellite accumulation areas are certainly recommended. [Your facility] will need to make a good faith estimate of the volume of waste that is generated monthly in satellite accumulation areas. For example we estimated that the volume of solvent waste generated in the paint area was 4 – 5 gallons per month, the volume of solvent waste generated in the wrap area was 3 gallons once every six months. The volume of aerosol residue would be most likely over estimated at 1 gallon a month counting both satellite areas.

Record Keeping and Reporting

Manifests and LDR Notifications

Although a complete record review was not conducted we did look at manifests and associated land disposal restriction (LDR) notifications for the past year. Your manifests and land disposal restriction notification appeared to be in order and well organized. The manifest records did indicate that you were a small quantity generator for 2003; however, it also showed that the

volume of waste generated during many months would be that of a conditionally exempt generator.

Sampling and Analysis Results and TUR reporting
You explained that [the facility] did maintain copies of their annual reports on-site you stated that you also maintained copies of [the facility's] TUR plan and annual updates. These were submitted when you were a large quantity generator. The Department no longer requires an annual progress report from small quantity generators. You also explained that you maintain on-site copies of any analysis that has been conducted to assist in making hazardous waste determinations.

Contingency Planning and Preparedness and Prevention
A small quantity generator is **not** required to have a complete hazardous waste contingency plan. However, as discussed above a small quantity generator is required to post certain information next to the phone closest to their hazardous waste storage area.

[The facility] appeared to be well equipped to respond to spills of hazardous materials. I have enclosed for your information a guidance document for "First Responder Spill Guidelines" this document provides information on spill reporting and related requirements.

Required action:
We found no issues with regard to your record keeping, with the exception of posting the proper information next to the phone where hazardous waste is being managed, which has already been discussed above. However, as you know, because of the limited time, I was only able to conduct a partial record review.

Training
There are training requirements within the hazardous waste regulations for both small quantity generators and large quantity generators. The training requirements for large quantity generators are very stringent. Small quantity generator training requirements are best described as a basic understanding of the hazardous waste regulations and how they apply to your facility. This basic training is necessary to comply with the small quantity generator rules. The training burden for small quantity generators falls on the emergency coordinator; however, regulations set forth in 40 CFR 262.34(d)(5)(iii); require the small quantity generator to ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relevant to their responsibilities during normal facility operations and emergencies. Although this was not specifically discussed it was clear that you were very familiar with the hazardous waste regulations. I also know that at least 3 [facility] representatives were present at the 2003 Northwest Environmental Conference. Attendance at this type of training would certainly meet the general training requirements for a small quantity generator.

Required Action:
[The facility's] managers and staff appear to meet the basic training requirements for small quantity generators and no action is required at this time.

Hazardous Waste Generator Status - Conclusion
It was determined that [the facility] was a small quantity generator for calendar year 2003. The technical assistance inspection determined that [the facility] generates the following hazardous wastes:

- 4 gallons per month or approximately 30 pounds of hazardous waste spent solvent is generated at the satellite accumulation area at the paint area.
- 3 gallons twice annually or approximately 20 pounds of hazardous waste spent solvent is generated every six months at the satellite accumulation area at Wrapping.
- 1 gallon per month or approximately 7 pounds of hazardous waste aerosol can residue is generated at 2 aerosol can satellite accumulation areas.
- 25 gallons twice annually or approximately 175 pounds of hazardous waste spent solvent is generated every six months from the cleaning of the solvent station in the paint storage room.

No other hazardous waste generator points, that require counting towards your generator category, were documented during this site visit. We did document the following wastes that because of existing exemptions or policies would not need to be counted towards you generator category:

- Waste generated from your wood treatment dip tanks, provided the waste is rendered non-liquid and it is managed as an X004 non-RCRA pesticide residue at a permitted hazardous waste facility, and is managed while on-site, in accordance with the Department's universal waste rules.
- Spent solvent in your Maintenance Shop and Veneer Preparation that are being managed by Safety Kleen under their Continued Use Program (CUP).
- Used oil, antifreeze, lead acid batteries, scrap metal, universal waste fluorescent tubes and rags destined for laundering.

Manifests records indicate that during the 2003 calendar year [the facility] has generated at least eight 55 gallon drums of paint related spent solvents [X-X]. If you were to take the hazardous waste identified during this inspection and accumulate it over a year you would only come up with a little over two drums of paint related spent solvent waste. Consequently, it may be in [the facility's] best interest to determine where the additional hazardous waste paint related material is being generated. If it is determined that the generation of the 6 additional drums during 2003 was a one-time event, [the facility] could conceivably be a conditionally exempt generator of hazardous waste. If it is determined that this waste is being generated as part of routine operations, then the point of generation should be identified and waste reduction opportunities should be investigated.

If you take the monthly generation rates listed above, even during a worst case scenario, [the facility] would be generating just over the 220 pound threshold for conditionally exempt generators. That is if [the facility] was to generate 25 gallons from the cleaning out the paint room solvent tank, generate 3 gallons of spent solvent at wrapping, generate 4 gallons of spent solvent in the paint area, and a gallon of aerosol can residue all in one month, [the facility] would generate 132 pounds of hazardous waste during that month. The 12 pounds over the 220 pound threshold could easily be "tweaked" to keep you under 220 pounds. For instance only put

20 gallons of solvent in the paint room tank. This alone would reduce the volume by 35 pounds.

Required Action
Please take the time to look into your total generation of paint solvent waste and let me know what you find. It would be great to see [the facility] reduce their generator status to that of a conditionally exempt generator.

Used Oil
[The facility] is a used oil generator and is responsible for compliance with the used oil generator regulations. The used oil generator rules are very simple; label tanks or containers that are used to store used oil with the words "used oil" or the words "waste oil," keep tanks and containers used to store used oil in good condition and covered so that rain water can not enter the tank or container, and if you have a release you must immediately clean up the release. The inspection of your used oil storage area found no areas of concern.

Toxic Use Reduction (TUR), Waste Minimization & Pollution Prevention
This portion of this report is comprised of recommendations and potential pollution prevention opportunities that were identified during the visit. The recommendations are for your consideration and were based on observations made during this technical assistance visit. If for any reason it is determined that these recommendations are something that will not work for [the facility], the Department is not asking [the facility] to implement the recommendations.

Tax Credit Opportunities:

- We discussed several projects that [the facility] has either implemented in the last year or has plans to implement in the near future that may be eligible for tax credits. The projects included:
    - The installation of your new trek line for wood treatment. This new wood treatment line used the latest technology and does the same quality treatment, but reduces the amount of treatment solution needed to treat the same volume of wood as the old system does.
    - The glue extruder system that [the facility] is seriously considering is a system that will likely reduce the amount of glue 10 fold once in place, the reduction in glue will in turn reduce isocyanates that are in the glue.
    - [The facility] will be installing a grinder for veneer waste. The waste veneer is currently costing [the facility] over a hundred dollars a day to manage as a waste. With the installation of a grinder [the facility] will be able to make the veneer waste into a usable product fit for recycling.

The three projects that we specifically discussed with you and likely other projects such as your distillation unit may very well be eligible for tax credits. So complete the application we discussed, paying particular attention to environmental gain by the implementation of the new technology, and we will hope for a positive outcome.

- For more information about tax credits please check out the following website: http://www.deq.state.or.us.msd.taxcredits/txcp.htm

- Following the inspection I thought of a way that you may be able to recycle your ink contaminated solvent in the paint area. The solvent you use for cleaning the ink equipment is the same solvent you use for thinning the ink. You might be able to use the ink contaminated solvent as a thinner for the ink. I realize you use a variety of inks I recall you mentioning something like six different ink colors. By using the ink contaminated solvent as a thinner you would not get a specific clear color; however this might not be that imperative. Another consideration would be if you use one ink more than the others you could keep that cleaning solvent separate from the other colors. Anyway it is worth considering.

  While on the subject of ink thinners, I would like to explain the hazardous waste regulatory difference between the use of your solvent as a thinner in the ink and the use of using the solvent as a cleaning material. The use of an MEK, toluene, xylene containing material as a thinner in you inks will not make the waste ink generated from this activity a listed hazardous waste. I have included a copy of a clarification on this issue from McCoy's RCRA Unraveled. However, solvents that meet the F001-F005 listing used to clean up contaminated equipment and parts used in the application of the ink or paint would certainly meet the listing.

  I did mention the recent EPA proposed rule regarding wipes. This is only a proposed rule and consequently you must assure that all wipes that contain your listed solvent are managed as hazardous waste. If and when this rule is final I will make a point to contact [the facility] and let you know how the new rule will impact your facility. I will say the new rule if passed will require that wipes that are not destined for laundering will not be allowed to contain free liquids, containers for the wipes will need to be closed and labeled, and you may need to determine by measurement the amount of solvent contained in the wipe. Again the rule is only proposed and I will be following up once the rule is a final rule and published in a federal register.

Recycling Activities

- [The facility] is taking advantage of the recycling opportunities available to them in Central Oregon. The facility wide color coding of your bins for the different recycling material is a great idea and certainly makes your recycled material more valuable.
- There were several containers of material in the hazardous waste storage area that you were in the process of determining if they still had a use. As discussed your storage of this material, as product, while you make this determination is not a problem. However, you should expedite the determination. You should also keep your generator status in mind when making this determination. Your current practice of doing routine facility

sweeps looking for chemicals that are abandoned or no longer appear to be being used is a good practice. It is not uncommon for facilities that are as large as [the facility] to do these cleanups every three to five years and in so doing find themselves regulated as a hazardous waste generator above the generator category they are accustom to maintaining.

Other Program Issues

- One issue that we observed was what appeared to be a small leak in the new Trek treatment tank area. You should have maintenance investigate the source of the leak and repair it as soon as possible. Pursuant to 340-142-0041(4)(d)&(e) our Division 142 Spill Requirements do require a facility to take steps to immediately cleanup and stop the source of a spill or release, even if that release is going into a sealed containment basin.

I want to thank you for your time and concern with compliance with the State's environmental regulations. I also want to express a sincere thank you for allowing us to use this site visit as hands on training for our new technical assistance staff member, [XX]. If you have any questions concerning this letter or other hazardous waste questions, please call me at [XX] in Bend.

Sincerely,

[XX]
Hazardous Waste Program
Eastern Region

Appendix 6:
Approach to Revisit Sample Size Estimate

Deriving an Estimated Target Number of Technical Assistance Site Revisits

This estimate is based on assumptions that DEQ analysis staff will want to check against DEQ's desired approach and program details. The population size used to create the estimate was 265, the number of site visits conducted in FY 2003. The correct sample size for other years will vary depending on number of site visits conducted. In addition, this approach treated all facilities as if they were the same – it did not differentiate between generator status, industry, geography, etc. DEQ may wish to expand upon the statistical approach to account for these variations or even choose a different statistical approach altogether.

Assumptions:

- The population has a normal distribution
- The variable in question is a yes/no variable: either the facility did or did not take action X, which could be (for example), that facility X did or did not implement 2 or more compliance recommendations.

The formula used to derive n (the number of site revisits) is as follows:

$$n = \pi(1-\pi) * \left(\frac{z}{B}\right)^2 \qquad = .25 * \left(\frac{z}{B}\right)^2$$

π = the proportion which did the action. $\pi(1-\pi)$ has a maximum of .25 because the highest value which this numerator can be is .50 (1-.50) = .25 and.

z is the z-score for the confidence interval, or in the case of 95% confidence, is 1.96.

B is the width of the interval, or margin of error, or in the example I gave above, is .1.

Therefore,

$$n = .25 * \left(\frac{1.96}{.1}\right)^2 = 96.04$$

Therefore, a sample size of 96.04 (or 97 should be able to get an estimate of the proportion of the population which is within .1 (or 10%) of the actual proportion (or percentage) of sites which did the action, with 95% confidence assuming a normal distribution.

Appendix 7:
Thurston County Technical Assistance Site Visit BMP Checklist

Thurston County Environmental Health
Business Pollution Prevention Program
Phone: (360) 754 4111 Fax: 754 2954
Revised October 2003

BEST MANAGEMENT PRACTICE RECOMMENDATIONS

BUSINESS NAME: _____DATE: _____

Recommendations	Already Doing	Suggested	Implemented (Date)
Recycle: (list recyclable items)			
Uses vendor for fluorescent lamps			
Uses vendor for batteries			
Uses vendor for computer monitors			
Other			
Waste Reduction:			
Control spills/leaks/drips			
Store products so they don't become a waste			
Use less-toxic products			
Other			
Waste Disposal: (list accumulated wastes)			
Remove excess accumulation of waste(s)			
Other			
Miscellaneous Improvements:			
Designate a "hazardous waste coordinator"			
Label containers with proper labels			
Keep Material Safety Data Sheets			
Obtain and maintain a spill kit			
Implement spill plan			
Seal floor drains			
Secure tanks and shelving			
Separate incompatible chemicals			
Train staff about hazardous materials			
Maintain catch basin & oil/water separator			
Other			

*The County may contact your business within a few months to find if these recommendations have been implemented.

Business Representative: _____ Position: _____